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FINAL REMOVAL ACTION WORK PLAN FOR SOIL AND GROUNDWATER AT SITE 6  
FENCED AREA NSWC INDIAN HEAD MD  
6/1/2007  
NAVFAC CHESAPEAKE

**Final**

# **Removal Action Work Plan for Site 6 (Fenced Area)**

**Naval Support Facility, Indian Head  
Indian Head, Maryland**

**Task Order 005**

**June 2008**

Prepared for

**Department of the Navy  
Naval Facilities Engineering Command Washington**

Under the

**JV III Program  
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Prepared by



**AGVIQ -CH2M HILL**

**Joint Venture**

# Contents

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<b>Acronyms and Abbreviations .....</b>	<b>v</b>
<b>1 Introduction .....</b>	<b>1-1</b>
1.1 Purpose of Removal Action.....	1-1
1.2 Scope of the Removal Action .....	1-2
1.3 Work Plan Organization .....	1-2
<b>2 Site Background and History .....</b>	<b>2-1</b>
2.1 Site Description and History .....	2-1
2.2 Previous Investigations .....	2-2
2.2.1 Initial Assessment Study.....	2-2
2.2.2 Phase II RCRA Facility Assessment .....	2-2
2.2.3 Remedial Investigation .....	2-2
2.2.4 Site 6 Additional Investigation .....	2-4
2.2.5 Pre-Excavation Silver Results for Subsurface Soil.....	2-4
2.2.6 EE/CA and Action Memorandum.....	2-5
<b>3 Removal Action Design Elements.....</b>	<b>3-1</b>
3.1 Removal Action Objective .....	3-1
3.2 Removal Action Performance Goal.....	3-1
3.3 Removal Action Description .....	3-1
<b>4 Removal Action Implementation .....</b>	<b>4-1</b>
4.1 Pre-Construction Activities .....	4-1
4.1.1 Pre-Excavation Disposal Characterization.....	4-1
4.1.2 Pre-Mobilization Coordination.....	4-2
4.1.3 Mobilization and Site Preparation.....	4-2
4.2 Construction Activities.....	4-6
4.2.1 Excavation Process Overview .....	4-6
4.2.2 Stockpiling of Soils.....	4-6
4.2.3 Management of Nuisance Water and Excavation Dewatering .....	4-7
4.3 Post-Construction Activities.....	4-7
4.3.1 Placement of Backfill .....	4-7
4.3.2 Waste Management .....	4-8
4.3.3 Site Restoration.....	4-8
4.3.4 Site Clean-up and Demobilization .....	4-9
<b>5 Project Management Plan .....</b>	<b>5-1</b>
5.1 Project Organization and Responsibilities .....	5-1
5.1.1 Navy Technical Representative .....	5-1
5.1.2 Facility Engineering Acquisition Department/NSF-IH.....	5-2
5.1.3 RAC Contractor.....	5-2
5.2 Project Meetings.....	5-3
5.2.1 Pre-Construction Meeting .....	5-3
5.2.2 Progress Meetings.....	5-4

5.2.3	Final Construction Meeting .....	5-4
5.3	Project Submittals .....	5-4
<b>6</b>	<b>References.....</b>	<b>6-1</b>

#### **Appendixes**

A	Project Schedule
B	Excavation and Material Handling Plan
C	Quality Assurance Plan
D	Health and Safety Plan
E	Erosion and Sediment Control Plan

#### **Tables**

2-1	Pre-Excavation Results for Subsurface Soil Sampling Activities at Site 6 (located at the end of Section 2)
5-1	Roles, Responsibilities, and Authorities of Individuals Assigned to this Task Order (located within text)

#### **Figures (Located at the end of each section)**

1-1	Facility Map
2-1	Pre-Excavation Sampling Map
3-1	Area(s) of Excavation Map
4-1	Haul Route Map
5-1	Organizational Chart



# Acronyms and Abbreviations

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amsl	above mean sea level
ANSI	American National Standards Institute
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CTE	central tendency exposure
EE/CA	engineering evaluation/cost analysis
ERA	Ecological Risk Assessment
ESCP	Erosion and Sediment Control Plan
FEAD	Facilities Engineering Acquisition Department
ft	foot, feet
ft <sup>2</sup>	square feet
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
HI	hazard index
IAS	Initial Assessment Study
IHIRT	Indian Head Installation Restoration Team
IR	Installation Restoration
JVIII	AGVIQ-CH2M HILL Joint Venture III
µg/L	micrograms per liter
MDE	Maryland Department of the Environment
mg/kg	milligram per kilogram
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NPL	National Priorities List
NSF-IH	Naval Support Facility, Indian Head
NTCRA	Non-Time-Critical Removal Action
NTR	Navy Technical Representative
PPE	personal protective equipment
PR	Preliminary Review
QC	quality control

RA	removal action
RAC	removal action contract
RAO	removal action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	Remedial Investigation
RME	reasonable maximum exposure
SOW	scope of work
SRG	site remediation goal
TCLP	toxicity characteristic leaching procedure
TO	Task Order
U.S.	United States
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
VSI	visual site inspection
WP	work plan
yd <sup>3</sup>	cubic yard

# Introduction

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This Removal Action (RA) Work Plan (WP) was prepared for Naval Facilities Engineering Command (NAVFAC) Washington by CH2M HILL and AGVIQ under the Joint Venture III (JVIII), Contract No. N40080-07-D-0301, Task Order (TO) 005. This document presents the background, rationale, approach, and implementation procedures necessary for the removal of surface and selected subsurface soils within the fenced area at Installation Restoration (IR) Program Site 6, Naval Support Facility, Indian Head (NSF-IH), Indian Head, Maryland (Figure 1-1).

## 1.1 Purpose of Removal Action

This Non-Time-Critical Removal Action (NTCRA) is being implemented by the United States (U.S.) Department of the Navy (Navy) using their RA authority under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Executive Order 12580. The RA objective (RAO) established in the Engineering Evaluation/Cost Analysis (EE/CA) for Site 6 (Fenced Area) (CH2M HILL, 2007) and associated Action Memorandum (NAVFAC Washington, 2007) is to remove and dispose of silver-contaminated surface soil and subsurface soil associated with the site to make sure that soil left in place does not represent an unacceptable risk to human health and the environment, and does not provide a continuing source of silver contamination to soil, sediment, and surface water beyond the fence.

To achieve the RAO, JVIII proposes to:

- Remove and properly dispose of surface soil (0 to 1 foot [ft] below ground surface [bgs]) contaminated with unacceptable levels of silver to mitigate risks to ecological receptors and to mitigate the potential transport of silver from the surface soil to the soil and/or stream and sediment beyond the fence line. The vertical extent of silver contamination was characterized by the pre-excavation investigation described in the EE/CA (CH2M HILL, 2007); therefore, post-excavation confirmation sampling is not required.
- Remove and properly dispose of subsurface soil (down to a depth of 4 ft bgs) at sample locations IS06SS10 and IS06SD09 to mitigate unacceptable potential risk to construction workers and resident children based on a Human Health Risk Assessment (HHRA) performed for the site.
- Backfill the excavated area to existing grade and certify and record final elevations by compaction testing using American Society for Testing and Materials (ASTM) geotechnical testing standards. Perform a final horizontal and vertical survey of the site to confirm final elevations after backfill.
- Abandon three groundwater monitoring wells at the site in accordance with the Maryland Department of the Environment (MDE) groundwater well abandonment/closure regulations by a Maryland-certified well driller.

- Perform limited site feature restoration (repair to a drainage swale and installation of a metal culvert in the drainage ditch).

## 1.2 Scope of the Removal Action

The JVIII will conduct the following work activities to implement the RA at Site 6. These activities will complete the RA scope, which includes the preparation of this WP.

- Mobilization and site set-up
- Excavation, transport, and disposal of impacted soils
- Backfill excavation
- Abandonment of three groundwater monitoring wells at the site
- Repair to the drainage swale at the site and installation of a metal culvert in the drainage ditch
- Site restoration
- Demobilization

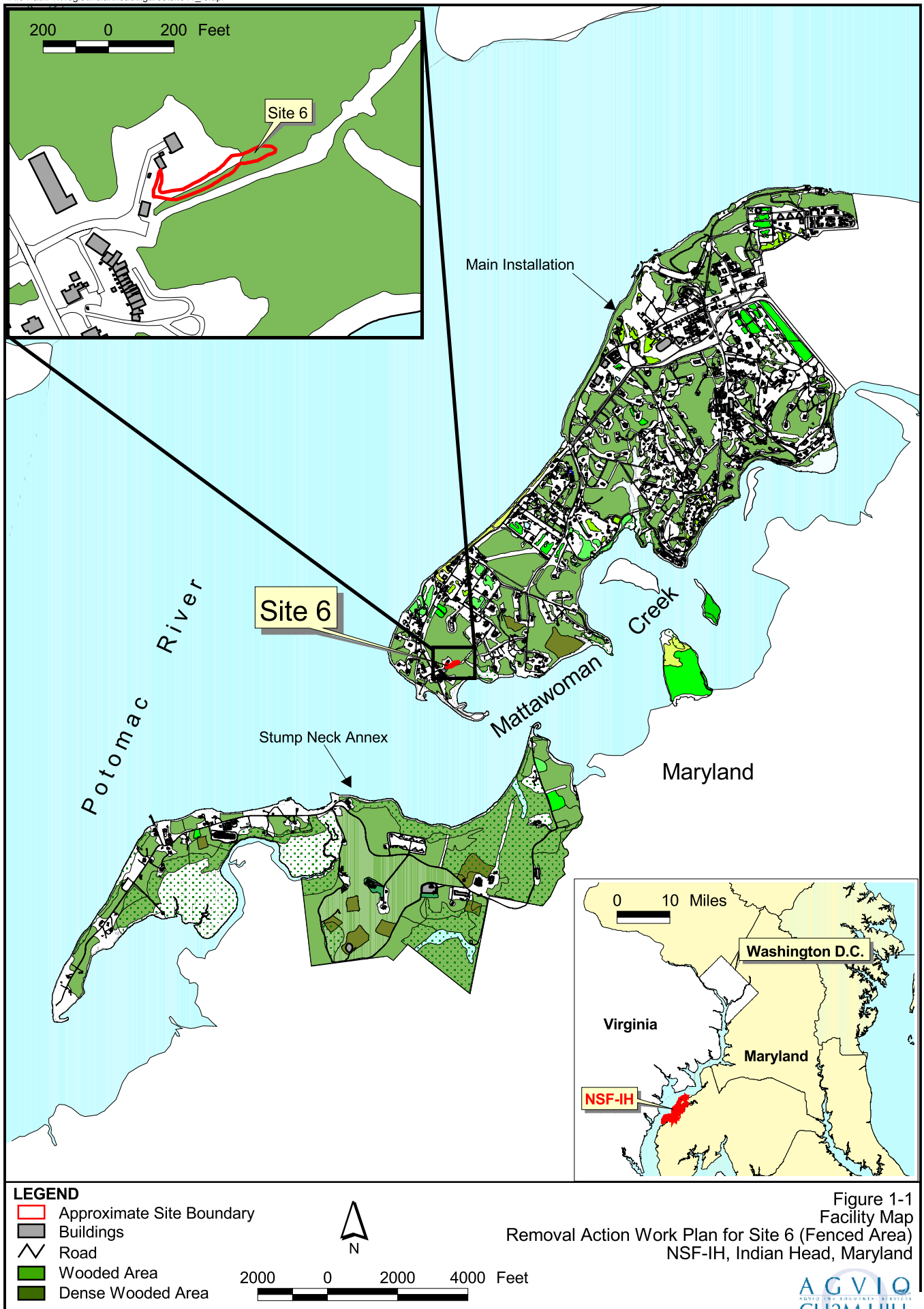
In addition, procurement, project management, and health and safety activities will be conducted for effective and efficient implementation of the RA. Upon completion of the field work, JVIII will prepare and submit a post construction closeout report, documenting the RA activities.

## 1.3 Work Plan Organization

This WP is organized into sections of text and appendices as follows:

- **Section 1, Introduction** – presents project background, purpose, and scope.
- **Section 2, Site Background and History** – describes current site conditions, including findings from the most recent investigations.
- **Section 3, Removal Action Design Elements** – provides the basis for the design of the RA.
- **Section 4, Removal Action Implementation** – provides details on the proposed RA construction activities, including mobilization, site preparation, excavation, waste management, backfill, and site restoration.
- **Section 5, Project Management Plan** – presents the project organization, team member responsibilities, lines of communication, meetings, and project deliverables for the implementation of the RA.
- **Section 6, References** – provides the documents cited in preparation of this WP.
- **Appendix A, Project Schedule** – presents a summary of tasks and associated subtasks together with the task duration and start/end dates.

- **Appendix B, Excavation and Material Handling Plan**—provides specific information for handling wastes during the implementation of this RA. This waste management plan discusses the characterization, disposal, handling, and transportation of waste generated during RA activities.
- **Appendix C, Quality Assurance Plan**—provides task specific quality control (QC) information.
- **Appendix D, Health and Safety Plan**—identifies the health and safety concerns that may be encountered during the implementation of the RA, and describes the measures to be implemented so that the RA is completed safely.
- **Appendix E, Erosion and Sediment Control Plan**—provides specific information to mitigate erosion activities during the implementation of the RA.



## SECTION 2

# Site Background and History

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NSF-IH is a Navy facility located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, D.C. The facility consists of two tracts of land: the main area on Cornwallis Neck Peninsula and the Stump Neck Annex on Stump Neck Peninsula located across Mattawoman Creek from the main area (Figure 1-1).

The main area is approximately 2,500 acres and is bounded by the Potomac River to the northwest, west, and south; Mattawoman Creek to the south and east; and the town of Indian Head to the northeast. Included as part of the main installation are Marsh Island and Thoroughfare Island, which are located in Mattawoman Creek. Elevations range from sea level to approximately 125 ft above mean sea level (amsl).

The Stump Neck Annex is approximately 1,084 acres and is bounded by Mattawoman Creek to the northeast, the Potomac River to the northwest, and Chicamuxen Creek to the south-southwest. Elevations range from sea level to approximately 10 ft amsl.

Both the main installation and the annex are on the National Priorities List (NPL). They are separated by Mattawoman Creek (noncontiguous), have separate U.S. Environmental Protection Agency (USEPA) identification numbers, and perform dissimilar operations.

## 2.1 Site Description and History

To reduce duplication of information, the information provided in this section is summarized from Section 5 of the *Final Remedial Investigation Report for Sites 6, 39, and 45* (herein referred to as Remedial Investigation [RI] Report) (HGL, 2004). Site 6 consists of the area around Building 1349 (the former control building, currently used for storage), Building 1718 (the current control building), and Building 1140 (the radiographic accelerator building).

The topography at Site 6 is characterized to the north by a relatively steep hill on which Buildings 1350 and 1140 are located. The area from the hill to the south is moderately sloped. A drainage ditch extends south of Building 1718 to a low area in the southwest corner of the site where water tends to pond. In addition to the ditch discharging into this low area, stormwater from offsite is carried by a culvert that crosses the access road and discharges into this low area. The ditch then extends in an eastward direction from the low area to the fence line.

Soil underlying the site, as determined from boring logs for the three monitoring wells (IS06MW01, IS06MW02, and IS06MW03) installed during the RI consists of light brown to grey silty clay to clay at the near surface. The clay is underlain by sand or sand with silt, which may be interbedded with clay.

The water table, as determined from the monitoring wells installed at the site, ranges in elevation from about 17.0 feet amsl (monitoring wells IS06MW01 and IS06MW02) to 13.9 ft

amsl (monitoring well IS06MW03). Based on these elevations, groundwater flows to the east – which is consistent with the expected shallow groundwater flow toward surface drainages to the east – and then southward into Mattawoman Creek.

## 2.2 Previous Investigations

### 2.2.1 Initial Assessment Study

The objective of the Initial Assessment Study (IAS) (Fred C. Hart Associates, 1983) was to identify and assess sites posing a threat to human health or to the environment owing to contamination from past hazardous materials operations at NSF-IH. The IAS report identified Site 6 as one of five sites exhibiting a potential threat. The IAS recommended a Confirmation Study for Site 6 only if silver at Site 5 was found to be a danger to aquatic life. Site 5 is the site of the Grain Manufacture and X-ray Building (Building 731). Site 6 is similar to Site 5 in that both sites discharged photographic developing wastes to open ditches. Results of the Confirmation Study conducted at Site 5 showed elevated levels of silver in soil samples collected from a drainage ditch at Site 5 (CH2M HILL, 1985).

### 2.2.2 Phase II RCRA Facility Assessment

A Phase II Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (Kearney and Brown, 1988) was conducted in 1988 by USEPA and consisted of a Preliminary Review (PR) of available documents and a Visual Site Inspection (VSI). The report indicated that operations at Building 1140 included the development of X-ray photographs. Approximately 2,000 X-ray sheets were developed in a month, and spent fixer and developer were discharged to an open ditch. It also reported that spent solutions were discharged into a 200-gallon polyurethane tank that was located outside of Building 1140. Building 1140 was constructed in 1965, and the tank was installed in the late 1970s. The tank was observed to be covered and rested on bare soil.

The RFA report indicated that approximately 10 gallons of fixer was reportedly spilled behind Building 1349, and a previous site inspection noted bare soil and stressed vegetation in an area covering approximately 200 square feet (ft<sup>2</sup>) in the area of the spill. Though areas of bare soil were observed during the VSI, there was no indication of what had caused it.

### 2.2.3 Remedial Investigation

As documented in Section 6.2.D of the Federal Facility Agreement, the Navy, USEPA, and MDE decided in 1996 to move Site 6 into the RI phase because of potentially high risks associated with this site.

Because no sampling had been conducted at this site up to the Phase II RFA point, surface soil, surface soil from intermittently wet areas, subsurface soil, surface water, and groundwater were collected and analyzed for various parameters, as part of the RI conducted at Site 6 and two other sites (HGL, 2004). All samples were collected from within the fenced area of Site 6 (Figure 2-1). This investigation was conducted to determine whether suspected releases of photographic process wastewaters were the cause of silver contamination of the soil, intermittent surface water, and shallow groundwater at Site 6. Section 5 of the RI Report presents detailed information on the sampling and analytical results.



In general, surface soil, surface soil from intermittently wet areas, and subsurface soil contained silver at levels that exceeded the facility-wide and site-specific background concentrations. The results are summarized below:

- For surface soil, the maximum silver concentration (1,160 milligrams per kilogram [mg/kg]) exceeded the 95 percent upper confidence limit (UCL) for facility-wide background (0.84 mg/kg) and the site-specific background concentration (nondetect above 0.56 mg/kg).
- For surface soil from intermittently wet areas, the maximum silver concentration (867 mg/kg) exceeded the 95% UCL for facility-wide background (0.92 mg/kg).
- For subsurface soil, the maximum silver concentration (1,100 mg/kg; collected at a depth of 30–36 inches bgs) exceeded the 95% UCL for facility-wide background (2.2 mg/kg) and the site-specific background concentration (nondetect above 0.47 mg/kg).
- Filtered (2 micrograms per liter [µg/L]) and nonfiltered (17.3 µg/L) silver were detected in one of the two surface water samples collected. There are no facility-wide background values or site-specific background values against which to compare these concentrations. Silver in surface water was attributed to weathering of surface soil and the surface soil from intermittently wet areas.
- Silver was not detected in any of the three unfiltered groundwater samples collected. However, dissolved silver (4.8 µg/L) was detected in monitoring well IS06MW03. The detection of silver in a filtered sample but not in the corresponding unfiltered sample was attributed to the analytical variability that occurs when a concentration is close to the detection limit, which was 1.7 µg/L.

A baseline HHRA was performed to evaluate current and future human health risks associated to environmental media and conditions at Site 6. The receptors evaluated in the risk assessment for both current and future uses included:

- For current uses—adolescent trespassers/visitors, adult trespassers/visitors, and industrial worker
- For future uses—adult resident, child residents, adolescent trespassers/visitors, adult trespassers/visitors, industrial workers, and construction workers.

The risk assessment initially screened the observed maximum concentration of silver in each medium against their respective USEPA Region III risk-based concentrations (RBCs). Only the medium for which the maximum silver concentration exceeded the RBCs was evaluated quantitatively in the risk assessment. For surface water and groundwater, the maximum silver concentrations detected were below their respective RBCs. Hence, they were not quantitatively evaluated in the risk assessment. The only environmental media quantitatively evaluated in the risk assessment were current and future surface soil. For the future scenario, the surface soil concentration was estimated by pooling the results from the analyses of the surface soil, surface soil from intermittently wet areas, and subsurface soil, as it was assumed that construction or excavation activities in the future would result in mixing of surface and subsurface soils.

The risk assessment subsequently determined that, under current conditions, soil does not represent an unacceptable risk to any of the receptors. The risk assessment also determined that, under future conditions, soil does not represent an unacceptable risk to the adult resident, adolescent trespassers/visitors, adult trespassers/visitors, and industrial workers. Under future conditions, however, silver poses potentially unacceptable risks to the reasonable maximum exposure (RME) child resident (hazard index [HI] = 3.2) and RME construction worker (HI = 1.2). Two discrete areas dominated the potentially unacceptable risks to these receptors. One area is in the location of sample IS06SS10 (southeast side of Building 1718), and the other area is in the location of sample IS06SD09 (adjacent to the culvert). The central tendency exposure (CTE) scenarios for the child resident (HI = 0.024) and construction worker (HI = 0.02) resulted in non-cancer hazards below the target value of one.

The Ecological Risk Assessment (ERA) results indicated that: (1) silver in surface soil may pose a potential risk to plants and invertebrates; (2) silver might have migrated offsite into the stream; and (3) if silver has migrated offsite, the magnitude of potential threat to ecological receptors is unknown.

## 2.2.4 Site 6 Additional Investigation

Based on the findings and conclusions of the RI Report, a Baseline ERA (BERA) Technical Memorandum (CH2M HILL, 2004) was prepared to address data gaps identified in the RI. The only portion of the BERA Technical Memorandum that was executed was the collection of three collocated sediment and surface water samples along the drainage ditch beyond the fenced area in October 2005 to evaluate potential offsite migration of silver. The sediment samples were analyzed for silver and the surface water samples for total and dissolved silver. A comparison of the silver results to background levels and ecological screening values indicated that silver had potentially migrated offsite.

The results were presented to the Indian Head Installation Restoration Team (IHIRT) at the January 2005 partnering meeting. The IHIRT agreed that an additional investigation was warranted and a sampling approach was presented in a WP entitled *Work Plan for Additional Investigation at Site 6, NDWIH, Indian Head, MD* (CH2M HILL, 2005). The objectives for the investigation were to: (1) identify the lateral extent of silver contamination to support either a RA or a finding of no further action (NFA) inside the fenced area; and (2) assess the need for a BERA or remediation outside the fenced area. The results are presented in a technical memorandum entitled *Site 6 Additional Investigation Results (AIR), NSF-IH, Indian Head, Maryland* (CH2M HILL, 2006a). Figures 2-1 and 2-2 of the AIR show the analytical results for inside and outside of the fenced areas, respectively, at Site 6. The results were presented to the IHIRT during the March 2006, and a decision was made to prepare an EE/CA to address soil removal down to a depth of 1 ft bgs using a soil removal cleanup level of 2 mg/kg inside the fence. Furthermore, the IHIRT agreed that a BERA should be conducted outside the fenced area.

## 2.2.5 Pre-Excavation Silver Results for Subsurface Soil

The Draft EE/CA (CH2M HILL, 2006b) proposed post-excavation confirmatory sampling at Site 6. Through discussions with the IHIRT, the Team proposed to conduct pre-excavation sampling to delineate the vertical extent of silver at the site (Figure 2-1). In summary, the

Team agreed to excavate down to a depth of 1 ft bgs over the area proposed for excavation and down to a depth of 4 ft bgs at locations IS06SS10 and IS06SD09 to address potential RME human health risk scenarios at these discrete areas due to elevated concentrations of silver observed during the RI. The results of this investigation are presented in Table 2-1.

### 2.2.6 EE/CA and Action Memorandum

An EE/CA (CH2M HILL, 2007) was conducted to evaluate the effectiveness, implementability, and cost of an NTCRA for surface and subsurface soil at the site to mitigate potential risks to ecological receptors (surface soil) and human receptors (selected subsurface locations) from silver-contaminated soil. The Action Memorandum (NAVFAC Washington, 2007) described the RA as soil excavation and offsite disposal for silver-contaminated surface soil within the fenced area at Site 6. Under this RA, silver-contaminated surface soil (0–1 ft bgs) will be removed from an approximate 0.2-acre area within the fenced area of Site 6. Post-excavation sampling will not be conducted because the IHIRT agreed to excavate laterally to the 2 mg/kg isoconcentration line for silver and vertically to a depth of 1 ft bgs. In addition, silver-contaminated subsurface soil (0–4 ft bgs) will be removed from two 10-ft by 10-ft locations. Post-excavation sampling will not be conducted in these areas because the IHIRT reached a consensus on the lateral and vertical extents of excavation.

TABLE 2-1

Pre-Excavation Silver Results in Subsurface Soil at Site 6 (Fenced Area)

*Summary of Validated Silver Results for Subsurface Soil Samples**NSF-IH, Indian Head, Maryland*

Station ID	IS06SO93			IS06SO94		IS06SO95		IS06SO96	
Sample ID	IS06SB930102	IS06SB930203	IS06SB93P0102	IS06SB940102	IS06SB940203	IS06SB950102	IS06SB950203	IS06SB960102	IS06SB960203
Sample Date/Time	10/26/06 12:15	10/26/06 12:25	10/26/06 12:20	10/26/06 11:30	10/26/06 11:40	10/26/06 10:45	10/26/06 10:55	10/26/06 10:00	10/26/06 10:10
Total Metals (mg/kg)									
Silver	2.5 J	4.8	1.5 J	1.5	0.047 U	0.25 B	0.053 U	22.3	2.6
Wet Chemistry									
Percent Solids	80	80	80	78	84	84	76	78	83

Notes:

ID = Identification

U - Analyte not detected

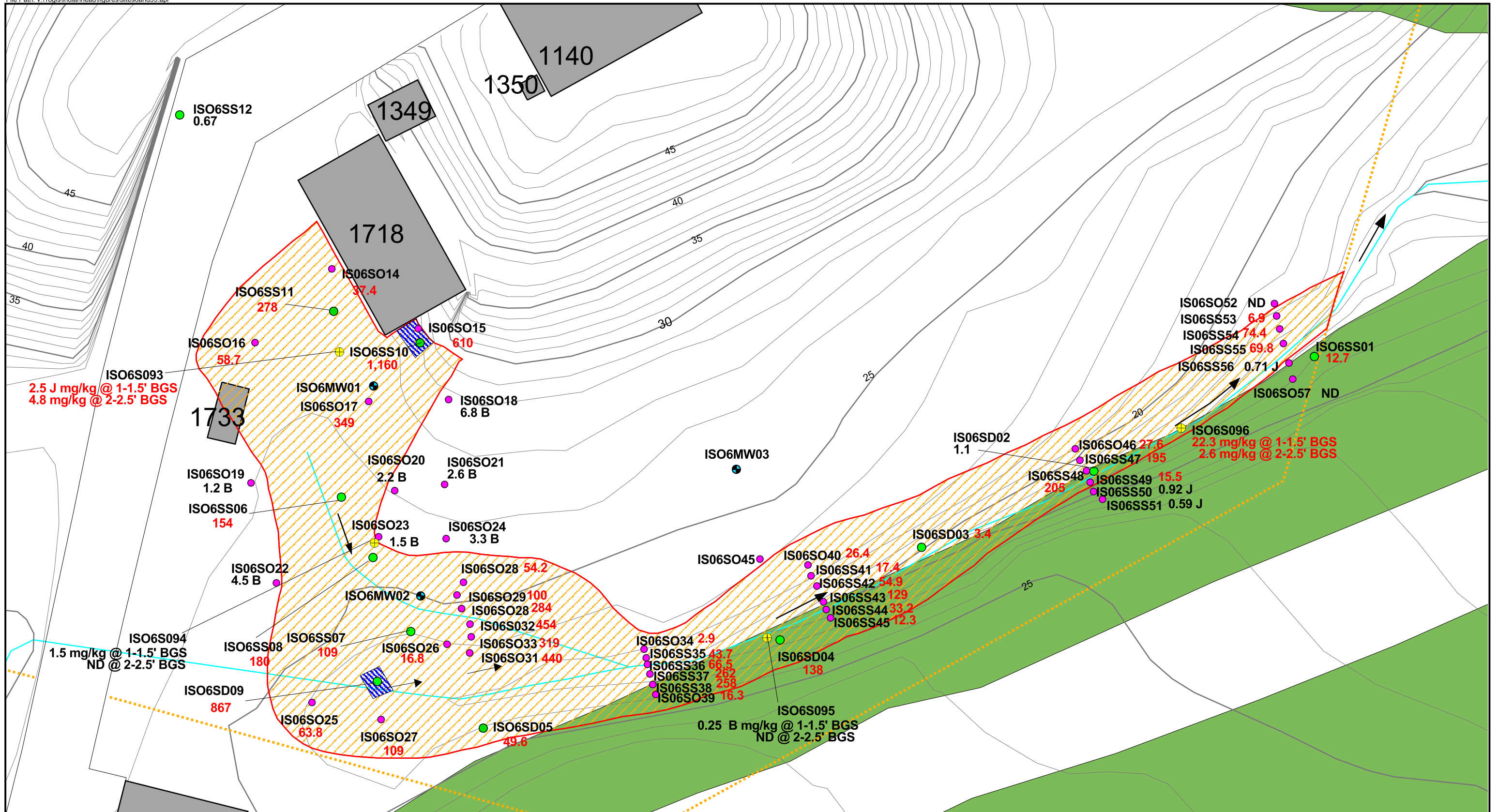
J - Estimated result

B - Attributed to blank contamination

Sample nomenclature incorporates base/site ID (IS06), sample type (SB for subsurface soil), last 2 digits of station ID, top depth (2 digits), and bottom depth (2 digits).

A field duplicate has a "P" following the 2-digit station number. One field duplicate sample was collected from station IS06SO93.

Shaded cells indicate silver is detected



# LEGEND

- Sample Location
- 2.2 Silver Concentration in mg/kg
- Previously Sampled Location (HGL, 2004)
- Monitoring Well Location
- Pre-excavation Sample Location
- Surface Water Drainage
- Fence
- Flow of Water in Ditch
- Isoconcentration Line - 2 mg/kg
- Proposed Area for Excavation to 1 foot BGS
- Proposed Area for Excavation to 4 feet BGS
- ND - Not Detected
- J - Estimated
- B - Possible Blank Contamination

## Notes:

- Concentrations in red indicate detection above the minimum ecologically based screening criteria of 2 mg/kg.
- Isoconcentration lines are drawn using the October 2005 analytical data.
- HGL, 2004 - Final Remedial Investigation for Sites 6,39, and 45.
- Map features are approximate.
- Figure is from "Draft Engineering Evaluation/Cost Analysis Site 6 (Fenced Area)" (CH2M HILL, 2006) and has been revised to reflect the pre-excavation sample locations and silver results.
- Locations ISO6SO93, ISO6SO94, ISO6SO95, and ISO6SO96 were sampled during the pre-excavation sampling event and surveyed with a GPS unit on October 26, 2006.

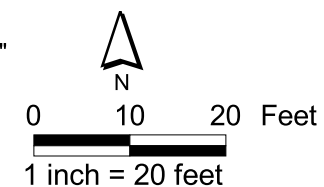


Figure 2-1  
Pre-Excavation Sampling Map  
Removal Action Work Plan for Site 6 (Fenced Area)  
NSF-IH, Indian Head, Maryland

## Removal Action Design Elements

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The selected RA, as documented in the Action Memorandum (NAVFAC Washington, 2007), is soil excavation and offsite disposal. Under this RA, silver-contaminated soil will be removed to 1 foot bgs within the 2 mg/kg isoconcentration line for silver and to 4 ft bgs in the two 10-ft by 10-ft locations of silver-contaminated subsurface soil (Figure 3-1).

### 3.1 Removal Action Objective

The NTCRA at Site 6 will be implemented by the Navy, utilizing their RA authority under CERCLA Section 104 and Executive Order 12580. The RAO established for the site is to remove and dispose of silver-contaminated surface soil and subsurface soil associated with the site to make sure that soil left in place does not represent an unacceptable risk to human health and the environment, and does not provide a continuing source of silver contamination to soil, sediment, and surface water beyond the fence.

### 3.2 Removal Action Performance Goal

As stated in Section 2.2.6, post-excavation sampling will not be conducted. The IHIRT reached a consensus on the lateral and vertical extents of excavation, as shown in Figure 3-1.

Silver is the only constituent investigated at this site because of past activities. An ecological site remediation goal (SRG) of 2 mg/kg was established for silver following the risk assessment and additional investigation to define the extent of impacted surface soil along the drainage ditch requiring a RA. The cleanup level of 2 mg/kg was selected by the IHIRT during the March 2006 partnering meeting. This value is a literature-based value and is the lowest known ecologically based screening criterion that is considered protective of terrestrial plants. The lateral extent of excavation corresponds to the 2 mg/kg isoconcentration line for silver. The vertical extent of excavation is based on IHIRT agreement with the results of the pre-excavation investigation (Section 2.2.5).

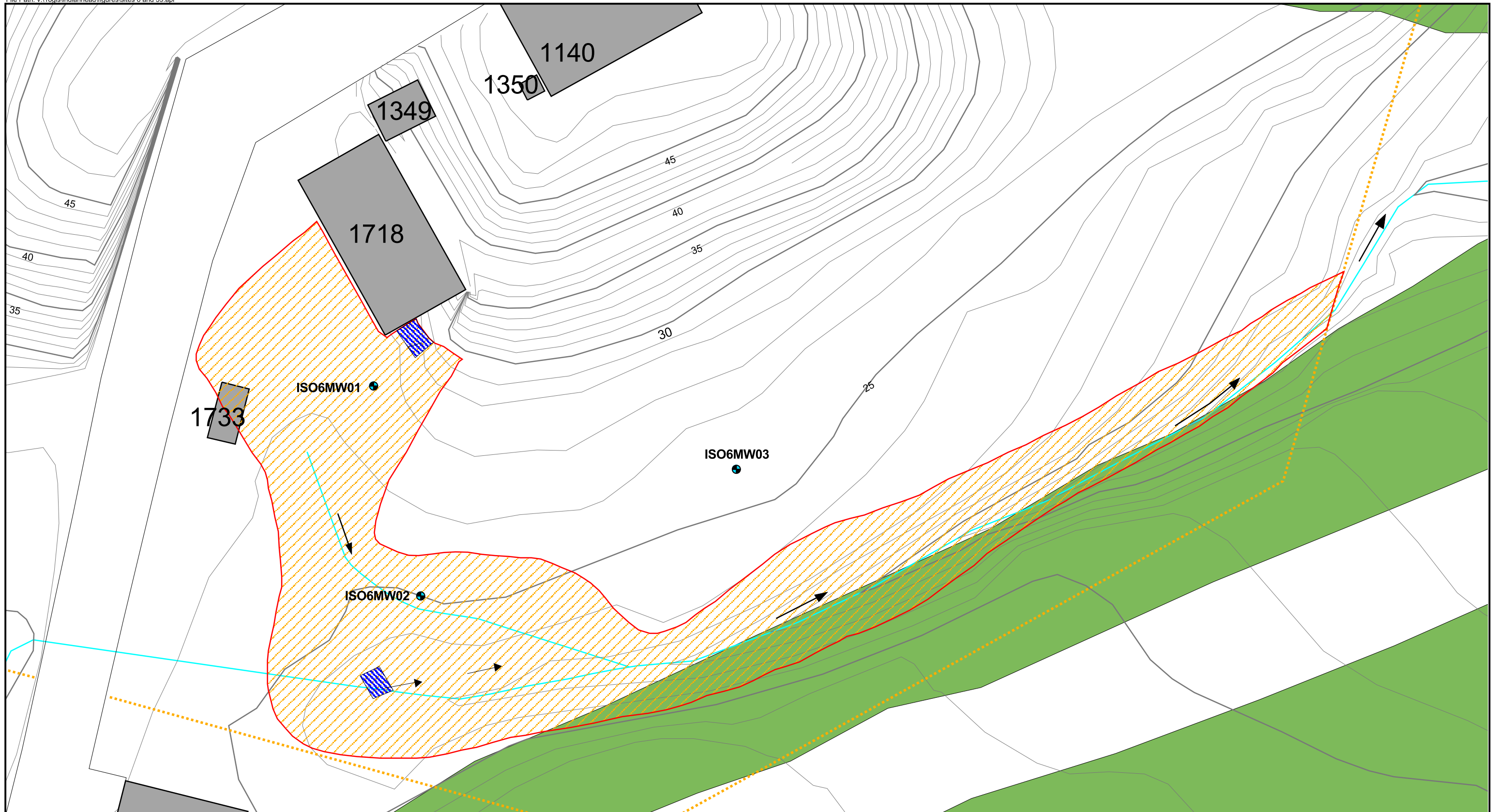
### 3.3 Removal Action Description

The total excavation area will be approximately 8,500 ft<sup>2</sup> to an average depth of 1 ft bgs (Figure 3-1); this corresponds to approximately 323 cubic yards (yd<sup>3</sup>) or 484 tons of material to be excavated. Two specific areas (Figure 3-1) will be excavated to a depth of 4 ft bgs. This excavated material will be disposed offsite as non-hazardous waste in a RCRA Subtitle D landfill.








Confirmatory soil samples will be not be collected from the bottom and sidewalls of the excavation area, as described in Section 3.2. After the impacted soil is removed, the cleanup goals will be considered achieved at Site 6. The area will be surveyed to check the vertical control of the excavation and certify the required excavation depth(s) have been achieved

across the site. The excavated area will be backfilled with clean backfill to existing grade and the ditch line will be repaired and reshaped to capture stormwater run-off (sheet-flow run-off) from the site.





**LEGEND**

-  Monitoring Well Location
-  Proposed Area for Excavation to 1 foot BGS
-  Proposed Area for Excavation to 4 feet BGS
-  Isoconcentration Line - 2 mg/kg
-  Surface Water Drainage
-  Fence
-  Flow of Water in Ditch

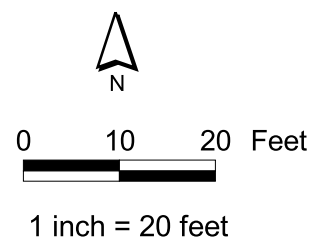


Figure 3-1  
Areas of Excavation Map  
Removal Action Work Plan for Site 6 (Fenced Area)  
NSF-IH, Indian Head, Maryland



# Removal Action Implementation

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A detailed description of the tasks and subtasks involved in the RA is presented within this section. The following major activities are included in this scope of work (SOW) for the RA:

- Pre-excavation disposal characterization
- Pre-mobilization coordination
- Mobilization and site preparation, including abandonment of three monitoring wells
- Excavation
- Transportation and disposal of excavated materials
- Waste management
- Backfill and restoration
- Demobilization
- Construction closeout reporting

The actual execution of the individual tasks will be pre-planned and continually adjusted to overlap durations of specific activities and perform other tasks consecutively to maximize the availability and utilization of on-site resources. The proposed project schedule is presented in Appendix A.

## 4.1 Pre-Construction Activities

To enhance the timely mobilization of JVIII resources and subcontractors and to meet operational schedule commitments, pre-construction activities, specifically pre-mobilization activities, will begin immediately upon approval of the final WP.

### 4.1.1 Pre-Excavation Disposal Characterization

To properly characterize materials for disposal prior to excavation and stockpiling operations, pre-excavation disposal characterization activities will be conducted at the site during mobilization and site preparation. A sampling grid of eight 40-ft by 40-ft squares will be established at the site. One soil sample will be collected from each square using a rubber-tire back-hoe or tracked mini excavator. These soil samples will be homogenized onsite to form one composite sample. (Additional samples will be collected if required by the disposal facility.) The composite sample will be analyzed by a certified laboratory for full-suite Toxicity Characteristic Leaching Procedure (TCLP), RCRA 8 Metals, ignitibility, corrosivity, pH, and reactivity, unless otherwise directed by the disposal facility.

Once the laboratory analyses are complete and data are received and reviewed by JVIII, the data will be forwarded to the Facilities Engineering Acquisition Department (FEAD), NAVFAC Washington, and NSF-IH personnel for review. The analytical data will be used by JVIII to identify an appropriate disposal facility. The selected disposal facility will be submitted to NAVFAC Washington for approval.

The SOW for this project provides only for disposal of non-hazardous wastes. In the event that any of the pre-excavation characterization data identify hazardous material, FEAD and Navy representatives will be notified immediately and a path forward will be jointly developed.

#### **4.1.2 Pre-Mobilization Coordination**

The following activities will be undertaken as part of the pre-mobilization activities.

##### **Utility Clearance**

Aboveground utilities are present within the site limits. Underground utilities will be identified before any excavation activities at the site. All excavation areas will be addressed in accordance with COMNAVREG MIDLANT Instruction 11300.1 and cleared by local utility operators through Miss Utility of Maryland's notification system (1-877-257-7777). JVIII will request a utility mark-out and will subcontract an independent utility locator service to perform a utility search within the excavation area before beginning any intrusive activities. JVIII will supply the Navy with a drawing outlining the work area at least one week prior to any planned field activities. A field inspection, as well as any other available information, will be used to verify the locations of utilities to prepare the site for all subsequent construction operations.

##### **Haul Route Review**

Vehicle and truck traffic is inherent in soil removal projects. Due to the site constraints and the proximity of the excavation area to Deep Point Court, an additional site access area along the southwest border of Building 1733 will be used. JVIII site management staff have developed, in coordination with NSF-IH, predetermined truck delivery and egress routes to minimize congestion and facilitate loading and offloading operations. Prior to finalizing the vehicle routes, JVIII will review and document pre-existing conditions. The entire onsite route, including all deficiencies and surfaces in need of repair, will be digitally photographed and submitted to the Navy for future reference. The proposed vehicle route will be driven by the site management staff as a final confirmation to also ensure that no weight limitations exist over any crossings or culverts. The final site haul route will not be designated until after the pre-construction meeting. Once approved by the FEAD, the route will be posted and clearly marked for hauling vehicles entering and exiting the site. This will include signage to direct traffic.

##### **Pre-Construction Meeting**

As discussed in Section 5.0, a pre-construction meeting will be held prior to the proposed mobilization date for field activities. The meeting will be held to present an overview of the RA, and to discuss project scope, schedule, planned invoicing, health and safety concerns, QC procedures, and any site logistical issues.

#### **4.1.3 Mobilization and Site Preparation**

##### **Mobilization**

Construction personnel equipment and materials will mobilize to the site to complete the project as defined in the statement of work. Initially, key individuals and equipment will

mobilize to receive equipment essential for completing the project activities. Mobilization will include initial site setup activities, establishment of a lay down area, staging of the site trailer, setup of sanitation facilities, and receipt of site preparation materials. Additional personnel and equipment will mobilize to the site as dictated by task resource demands, and be subsequently released from the project when work assignments are completed.

### Site Preparation

Once initial mobilization is completed, site preparation activities will be conducted. Site preparation will consist of work zone delineation, installation of erosion and sediment controls, establishment of a material staging area, and site clearing. JVIII will strategically locate high visibility fence and traffic cones to identify traffic routes and lanes for the hauling vehicles (as needed). Signage will be posted indicating these areas are considered restricted. The site preparation will consist of the following:

- Utility clearance performed and verified by third party subcontractor
- Installing erosion and sediment control features for the site per approved plan
- Performing initial survey activities, including the installation of control points by a licensed surveyor for monitoring the excavation activities at the site
- Surveying the area and establishing existing conditions and controls at the site
- Informing security personnel of site activities and duration for access of construction vehicles and hauling trucks
- Establishing appropriate signage for the project indicating site activities and the hauling routes for access to the site and egress from the site. This will include setting up flagman stations for site control.
- Staging of the site office trailer with electrical, phone, and electrical utilities
- Abandoning monitoring wells ISO6MW01, IS06MW02, and IS06MW03 (Figure 3-1) in accordance with MDE requirements
- Setting up waste material(s) staging areas at the site with appropriate erosion and sediment control
- Setting up the soil staging area for backfill materials/site materials with appropriate erosion and sediment control
- Establishing the environmental exclusion zones at the site with reduction zones (Hot Zone, Warm Zone, and Cold Zone) with marking tape and signage
- Setting up a decontamination area for equipment and equipment staging area
- Setting up additional material staging areas with appropriate erosion and sediment control
- Implementing clearing operations for specific areas in the excavation area

## Site Clearing Activities

Prior to performing excavation activities along the southern portion of the excavation area (Figure 3-1), site clearing operations will be necessary. The area requiring clearing is located in one area and is approximately 0.05 acres in size.

Site clearing operations will involve tree felling, brush removal, and vegetation reduction operations. These activities will be executed within a limited area in the southern portion of the remedial area. It is anticipated that land clearing will be executed by both mechanized heavy equipment and ground personnel. When appropriate, trees will be felled by ground crews utilizing chain saws (or brush cutters for small diameter materials). The minimum personal protective equipment (PPE) selection for site clearing operations will be as follows:

- Long trousers, chainsaw chaps, and appropriate footwear (American National Standard Institute [ANSI] rated)
- ANSI Z87 approved eyewear with a face shield
- A hardhat with the visor facing forward
- Leather work gloves
- Long-sleeved shirt
- Ear muffs

For safety purposes, substitution of high visibility clothing will be considered where reflective/high visibility vests are normally used.

Trees and other removed vegetation will be consolidated to central processing areas via mechanized heavy equipment outfitted with sufficient material handling attachments. Felled trees and other removed vegetation will be fed into and reduced using a large diameter wood chipper (approximately 12 inches). Feeding of consolidated trees and vegetation will be performed with the mechanized heavy equipment, to the extent possible.

Once clearing operations are substantially completed, grubbing will begin. Where grubbing operations are required, stumps will be removed with mechanized heavy equipment, such as a track excavator. Soil will be removed from the stump root mass to the extent possible and left in place.

Specific safety guidelines and practices for the clearing activities are included in the Health and Safety Plan (HASP) in Appendix D.

## Work Zone Delineation

NSF-IH work restrictions and requirements will be implemented throughout the project duration because of the work area's location within the NAVFAC Washington and Naval Support Activity South Potomac Security Area. Access to work areas will utilize non-essential routes to the maximum extent possible to minimize incursions onto active essential pavements.

To better understand the delineation of work zones at the site, the operations have been defined using environmental exclusion zones, identified by distance and reduction zones for decontamination, with specific requirements:

- **Exclusion Zone (Hot Zone):** Area of excavation where equipment is actively performing intrusive subsurface work. The area will be considered large enough in circumference to encircle the excavation, support equipment, and personnel working in the area of excavation (an area with a radius of approximately 75 ft). This area will have caution tape placed around it to identify and indicate specific PPE and/or training may be required for entering this area.
- **Reduction Zone (Warm Zone):** Area adjacent to the Hot Zone; considered twice the radius of the Hot Zone encircling the work area. This area comprises reduction equipment (e.g., decontamination support equipment, washing stations) and authorized support personnel. This area will not have caution tape around it; however, traffic cones will mark specific entry points to indicate that specific PPE and/or training may be required for entering this area.
- **Cold Zone:** Area adjacent to the Warm Zone; the remaining portion of the site outside of the work area. This area comprises equipment, support personnel, trailers, stockpile staging areas, and material staging areas, and any additional equipment or personnel needed to perform the activities at the site. This area will not have caution tape placed around it; however, signage will mark specific entry points to the Warm Zone and indicate specific PPE and/or training required prior to entering areas beyond the Cold Zone.

### Erosion and Sediment Controls

Erosion and sediment controls will be installed in accordance with the Erosion and Sediment Control Plan (ESCP) in Appendix E. Temporary erosion and sediment controls will consist of perimeter controls, diversion dikes, and sediment traps. Permanent erosion and sediment controls will include erosion control matting, riprap, and permanent seeding.

All erosion and sediment controls will be established, inspected, and maintained in accordance with the *Maryland Erosion and Sediment Control Guidelines for State and Federal Projects* (MDE, 2004). This includes daily inspections of installed controls to ensure the features are in-place and properly performing sediment control.

### Spill Prevention

To minimize the potential for spills and or releases from stationary fuel tanks, heavy equipment, and trucks, visual inspections will be performed periodically through the work shift for signs of drips, leakage, or stains on ground surfaces and on and below the equipment. A fueling area will be pre-designated, and the ground surface will be protected in the event of a leak or spill from overfilling. JVIII will utilize a fuel vendor to deliver fuel and dispense directly into the equipment or a 500-gallon double-walled aboveground storage tank (AST) with a containment system.

The JVIII will have spill prevention and containment for recovery activities for spills up to 100 gallons. A larger spill may require additional support; therefore, JVIII will identify the closest (off-base; subcontractor provided) facility available with spill response equipment

and materials. Onsite spill response equipment will include absorbent materials, sand, and other spill-containment devices necessary to prevent migration. Other equipment will include construction equipment used in ongoing construction activities, as outlined in the HASP (Appendix D).

All equipment will be tested and maintained as necessary to ensure its proper operation in time of emergency. After an emergency, all equipment will be cleaned and ready for its intended use before normal operations resume.

## 4.2 Construction Activities

### 4.2.1 Excavation Process Overview

Excavation activities will consist of removing silver-contaminated soil to 1 ft bgs within the 2 mg/kg isoconcentration line for silver and to 4 ft bgs in the two 10-ft by 10-ft locations of silver-contaminated subsurface soil (Figure 3-1). Removal of these soils will achieve the ecological clean-up goal of 2 mg/kg for silver. Removal activities at the site may be accomplished using a tracked excavator and/or a bulldozer. In addition, hand digging will be required at several areas of the site because of the depth and location of known subsurface utilities and equipment. Elevation measurements will be recorded by the JVIII during excavation operations to monitor the activities performed at the site.

The limits of excavation are shown on Figure 3-1. The total estimated volume is approximately 323 yd<sup>3</sup>. It is not anticipated that this quantity will increase because pre-excavation samples were collected to define lateral and vertical extents of silver contamination, and the lateral and vertical extents of excavation were subsequently agreed to by the IHIRT.

The excavation sequence will be as follows:

- Excavate the impacted soil interval (1 ft to 4 ft bgs) and stockpile for offsite disposal in accordance with all federal, state, and local regulations
- Set up dewatering equipment to remove nuisance water intrusion from the excavated area, as needed
- Once the vertical depths of excavation have been achieved (1 ft bgs across the site and 4 ft bgs in two discrete 10-ft by 10-ft areas), cease excavation activities and continue dewatering operations to remove nuisance water from the excavation, as needed
- Backfill the excavation using clean soil from an offsite borrow pit

In the event that conditions are extremely dry, JVIII technicians will implement dust control measures to minimize visible dust emissions from wind blown sediments and will implement street sweepers to remove soils from site roadways.

### 4.2.2 Stockpiling of Soils

Excavated soil will be stockpiled on the court of Deep Point Court. To prevent the soil, or water from rain-saturated soil, from being released from the staged area, the soil will be staged in a geotextile-lined structure. Any water that is captured in the liner will be pumped

from the geotextile-lined structure onto the ground surface through filtration bags to remove silts.

### 4.2.3 Management of Nuisance Water and Excavation Dewatering

Nuisance water affects site productivity, since a flash thunderstorm generating stormwater could cause flooding at the site and prevent excavation operations until the water is removed from the excavation area. Therefore, nuisance water management is considered a risk factor for the projected schedule, and maintaining or suppressing nuisance water is vital to comply with the critical path for production activities at the site. Consequently, water management practices will be initiated to minimize runoff into the excavation.

JVIII will manage nuisance water within the excavation as site conditions allow. The primary method for removing nuisance water will be to pump the water through hoses to a location downgradient of the excavation within the Site 6 boundary. Water would be allowed to filter back into the subsurface across the site. However, if site conditions prevent this activity (e.g., large volumes of nuisance water must be diverted to surface/subsurface soils, causing runoff back into the excavation), an alternative method will be implemented.

An alternative method for removing nuisance water (pending approval) would be to pump the water to a frac tank for storage. Once the excavation activities and site restoration are completed, this water could be discharged through a filtration bag across the site. However, this option could require additional effort to complete.

## 4.3 Post-Construction Activities

### 4.3.1 Placement of Backfill

Following the completion of excavation activities, JVIII will confer with the Navy to begin backfilling operations. It is assumed that approximately 404 yd<sup>3</sup> of soil will be required to backfill the excavation (323 yd<sup>3</sup> of soil to be excavated multiplied by a conversion factor of 1.25 to account for soil compaction). These soils will be a mixture of clay and topsoil. All backfill will be brought to the site from an offsite borrow pit. A sample of the proposed offsite backfill material will be collected and analyzed to establish the chemical concentrations and certify the material is appropriate for use as clean backfill material. One round of sampling for analytical testing will be performed on offsite fill material per approved source. Soil will be sampled for the following parameters:

- Gasoline Range Organics (Method 5030 sample prep with Modified 8015 [CA GC-FID Method])
- Diesel Range Organics (Method 5030 and 3550 sample prep with Modified 8015)
- Oil and Grease with Silica Gel Scrub (USEPA Method 9071)
- RCRA Metals (TCLP) (USEPA Method SW-846 1311)
- Silver (USEPA Method SW-846 6010B)

Clean backfill material will be placed by dump trucks and/or loaders into the excavation. The backfill material will be spread across the excavation to grade using tracked bulldozers

and/or tracked excavators in small areas, as needed. Compaction rates will be based on the weight of the heavy machinery pushing the backfill material and spreading into the excavation. Some compaction in small areas may utilize the weight of the excavator bucket in 6-inch lifts to compact the backfill material. The final compaction of the backfill will be certified by using standard proctor and compaction tests at five locations in the excavation area, following ASTM geotechnical standards.

Backfill and final grade will be verified by surveying the site after activities have been complete to record the final elevation of the excavation areas.

### 4.3.2 Waste Management

The following waste types are anticipated to be generated during the implementation of the RA:

- Cleared vegetation
- Non-hazardous excavated soils
- Construction debris and general trash, including disposable sampling equipment and PPE
- Decontamination fluids for equipment and personnel

An Excavation and Material Handling Plan is provided in Appendix B, which describes the management requirements and procedures for handling the above wastes. In general, excavation wastes will be staged in lined and bermed staging areas, and uncontaminated construction debris and trash will be disposed in solid waste receptacles at NSF-IH.

### 4.3.3 Site Restoration

After the backfill activities are completed, soil stabilization activities will start across the site. These will consist of hydroseeding the upland portion for the site. Additional soil stabilization will consist of utilizing the straw bales from the stockpile of soils generated during the excavation activities.

An additional 100 tons of riprap (rock) will be installed along the drainage swale. The existing corrugated metal culvert piping (approximately 40 linear ft) within the drainage ditch will be replaced.

Asphalt repair will be completed along roadways damaged during site operations (by hauling, heavy equipment, and other vehicular traffic). The typical asphalt design will consist of the Maryland Department of Transportation asphalt road design or NAVFAC specifications. Areas anticipated for repair include corners along intersections and the roadway adjacent to Building 1733. The FEAD representative will inspect all asphalt repair completed at the site.

Furthermore, a street sweeper will be utilized to remove residual materials from any impacted sections from the haul roads, as necessary.



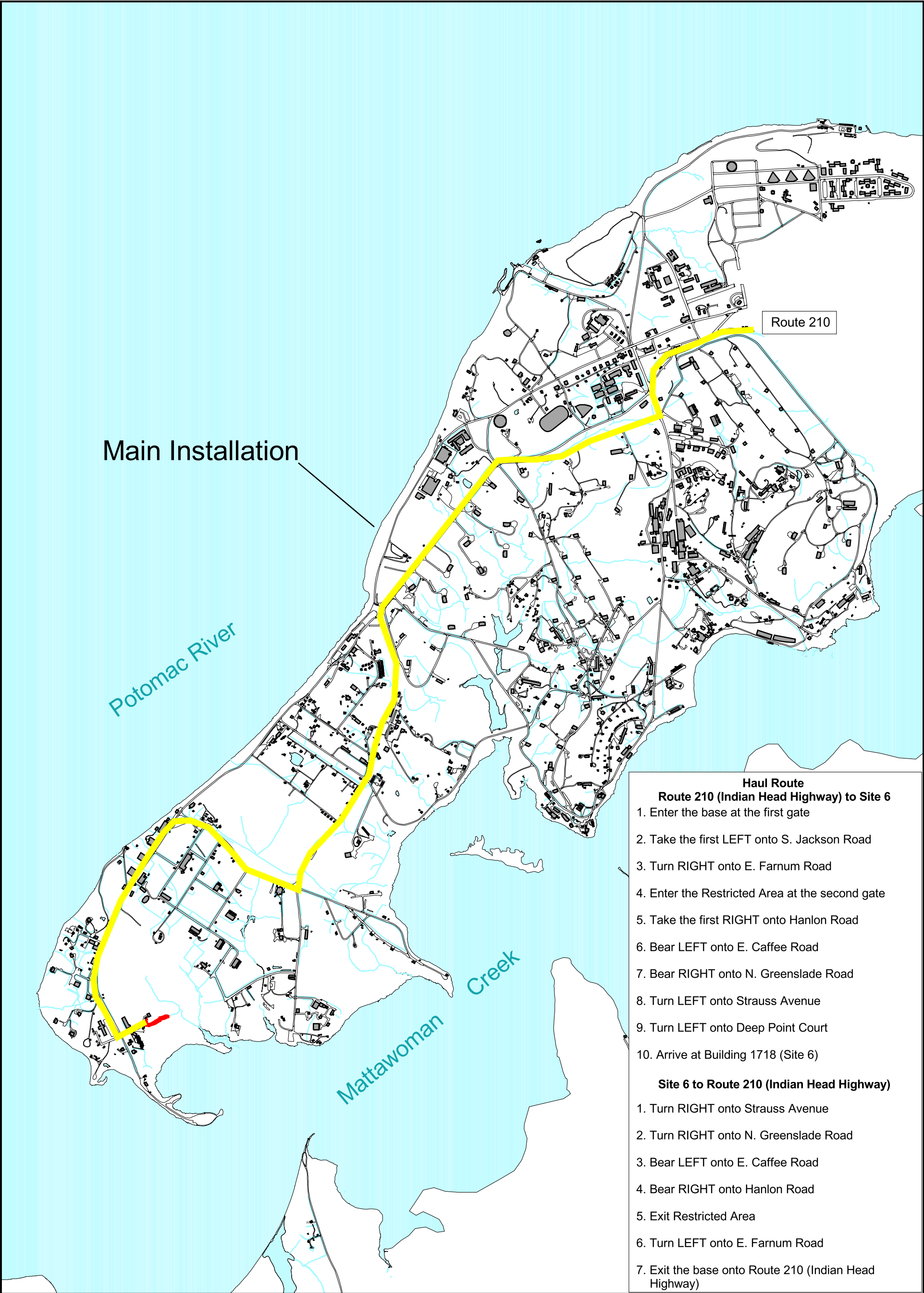
#### 4.3.4 Site Clean-up and Demobilization

Site clean-up will consist of removing all support equipment, staging areas for backfill materials, waste materials, and heavy equipment. All equipment will be free of solid material(s) and decontaminated using potable water and alconox or detergent prior to demobilization.

All stockpile areas and silt fence will be removed, the area will be seeded, and hay will be installed across the surface, per the sequence of construction in the site ESCP (Appendix E). A final site punch list will be completed and approved by the FEAD prior to demobilization.

A final site closeout inspection will be performed by NAVFAC Washington, which will focus on items that have been performed or will be performed prior to project completion. Items that are incomplete or require further work to meet the project specification will be documented by the designated QC Manager and corrected by the project team within a reasonable time. Once completed, the Navy will be advised in writing and a final inspection will be conducted involving the same personnel to verify the items in question have been completed.

Once the final inspection is complete and the work is accepted, JVIII will demobilize personnel and equipment. Materials used during the performance of site activities will be removed and/or disposed offsite in accordance with federal, state, and local regulations.



**LEGEND**

- ▭ Approximate Site Boundary
- ↘ Haul Route
- Buildings

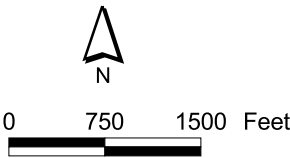


Figure 4-1  
Haul Route Map  
Removal Action Work Plan for Site 6 (Fenced Area)  
NSF-IH, Indian Head, Maryland

# Project Management Plan

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This Project Management Plan has been prepared to define the project organization, identify key personnel and their responsibilities, and establish reporting requirements and lines of communication for the implementation of the RA at the site. This plan also includes an overall project schedule, a list of anticipated meetings, and the project deliverables required during this RA. This plan has been developed to maintain consistency in procedures and communications during the implementation of the RA.

## 5.1 Project Organization and Responsibilities

The organizations that will participate in the implementation of this RA are described in this subsection. These organizations have specific functions according to their project responsibilities. A project organization chart outlining the relationship between the project organizations is shown on Figure 5-1. Roles, responsibilities, and authorities of the RA contractor personnel are listed on Table 5-1. The project organizations include the following:

- Owner: Navy
- Lead Regulatory Agency: USEPA Region III
- Support Regulatory Agency: MDE
- Removal Action Contract (RAC) Contractor: AGVIQ-CH2M HILL Joint Venture III
- Subcontractors:
  - Utility Locator: Accumark, Inc.
  - Surveyor: Patton, Harris, Rust & Associates
  - Driller (well abandonment): Parratt-Wolff, Inc.
  - Laboratory (Analytical): CompuChem
  - Laboratory (Geotechnical): ECS Mid-Atlantic, LLC
  - Waste Disposal: Earthcare Solutions, Inc.

### 5.1.1 Navy Technical Representative

As Navy Technical Representative (NTR) at NAVFAC Washington, Mr. Joe Rail will be the primary contact. He will be ultimately responsible for the execution of the RA. He will direct JVIII during the implementation of the RA. In addition, he will be responsible for the following:

- Administering payment of approved invoices to contractors and ensuring that the funds available are sufficient to meet the requirements of the RA

- Directing all project interfacing with local, state, and federal regulators and submittals to the Navy

### 5.1.2 Facility Engineering Acquisition Department/NSF-IH

Ms. Cathy Gardner will represent FEAD. She will represent NAVFAC Washington as the Construction Project Manager for the Navy. She will be the immediate interface with the RAC contractor, and will be responsible for the following:

- Attending pre-construction meetings, progress meetings, and the final construction meeting
- Arranging and securing facility and site access
- Conducting progress inspections of the RA
- Mitigating interference and delays, resolving site issues, and reporting progress to the Navy

### 5.1.3 RAC Contractor

JVIII will act as the primary point of contact for construction at the site, and will perform the following activities:

- Implementing the RA in accordance with the approved WP
- Observing, documenting, and evaluating any subcontractor performance
- Assisting with administration of construction changes
- Tracking the progress of construction activities with respect to the construction schedule
- Receiving and reviewing subcontractors' recovery schedules
- Observing contractor health and safety practices, and noting any deficiencies.

TABLE 5-1  
Roles, Responsibilities, and Authorities of Individuals Assigned to this Task Order

Role	Responsibility	Authority
Project Manager	Management and technical direction of work	Approve subcontractor selection
	Communication with the Navy	Approve invoices to the Navy
	Overview subcontractor performance	Approve TO baseline schedule
	Select TO staff	Stop work at the site for reasons relating to health and safety
	Develop WPs and support plans	Approve payment to vendors and suppliers
	Meet performance objectives	Approve payment to subcontractors
	Prepare status reports	

**TABLE 5-1**  
Roles, Responsibilities, and Authorities of Individuals Assigned to this Task Order

<b>Role</b>	<b>Responsibility</b>	<b>Authority</b>
Site Superintendent	Responsible for all site activities	Stop work if there is a health and safety risk
	Provide direction to subcontractors	Approve corrective action for site work-arounds
	Act for project manager	Approve materials and labor costs for site operations
	Provide daily status reports	Resolve subcontractor interface issues
	Conduct daily safety briefings	Approve daily and weekly status reports
	Review subcontractor qualifications	Approve subcontractor daily report of waste material removed from site
	Stop work for unsafe conditions or practices	Approve corrective action plan for transport and disposal
	Plan and coordinate the transport and disposal of waste	Set weekly safety objectives
	Monitor and report on subcontractor health and safety performance	Approve resumption of work for resolved health and safety issues
	Record and report safety statistics	
	Conduct site health and safety orientation	
	Maintain environmental log	

## 5.2 Project Meetings

Project meetings will be held during the RA implementation to monitor progress and coordinate RA activities. A representative from JVIII will record the minutes of each meeting and will furnish copies of the minutes to the Navy and other parties as necessary. The following meetings will be held during implementation of the RA:

- Pre-construction meeting
- Progress meetings
- Final construction meeting

### 5.2.1 Pre-Construction Meeting

A pre-construction meeting will be held at the site or via conference call at least 1 week prior to the proposed mobilization date for field activities. The FEAD office in coordination with the JVIII will identify a date, time, and location for the pre-construction meeting. The pre-construction meeting will be attended by the Navy, JVIII, FEAD, Buildings 1733 and 1349 representatives, fire department, NSF-IH security representatives, and other invited stakeholders.

JVIII representatives will present an overview of the RA and will be prepared to discuss project scope, schedule, planned invoicing, health and safety concerns, QC procedures, and any site logistical issues.

### 5.2.2 Progress Meetings

Progress meetings will be scheduled as needed, with appropriate notice, by the Navy or JVIII. Special or impromptu meetings may be called to resolve issues arising between the progress meetings.

### 5.2.3 Final Construction Meeting

A FEAD walkthrough will be held as the final inspection of work. This walkthrough will be attended by the Navy and the JVIII and will serve as the final inspection prior to submitting the closeout report.

## 5.3 Project Submittals

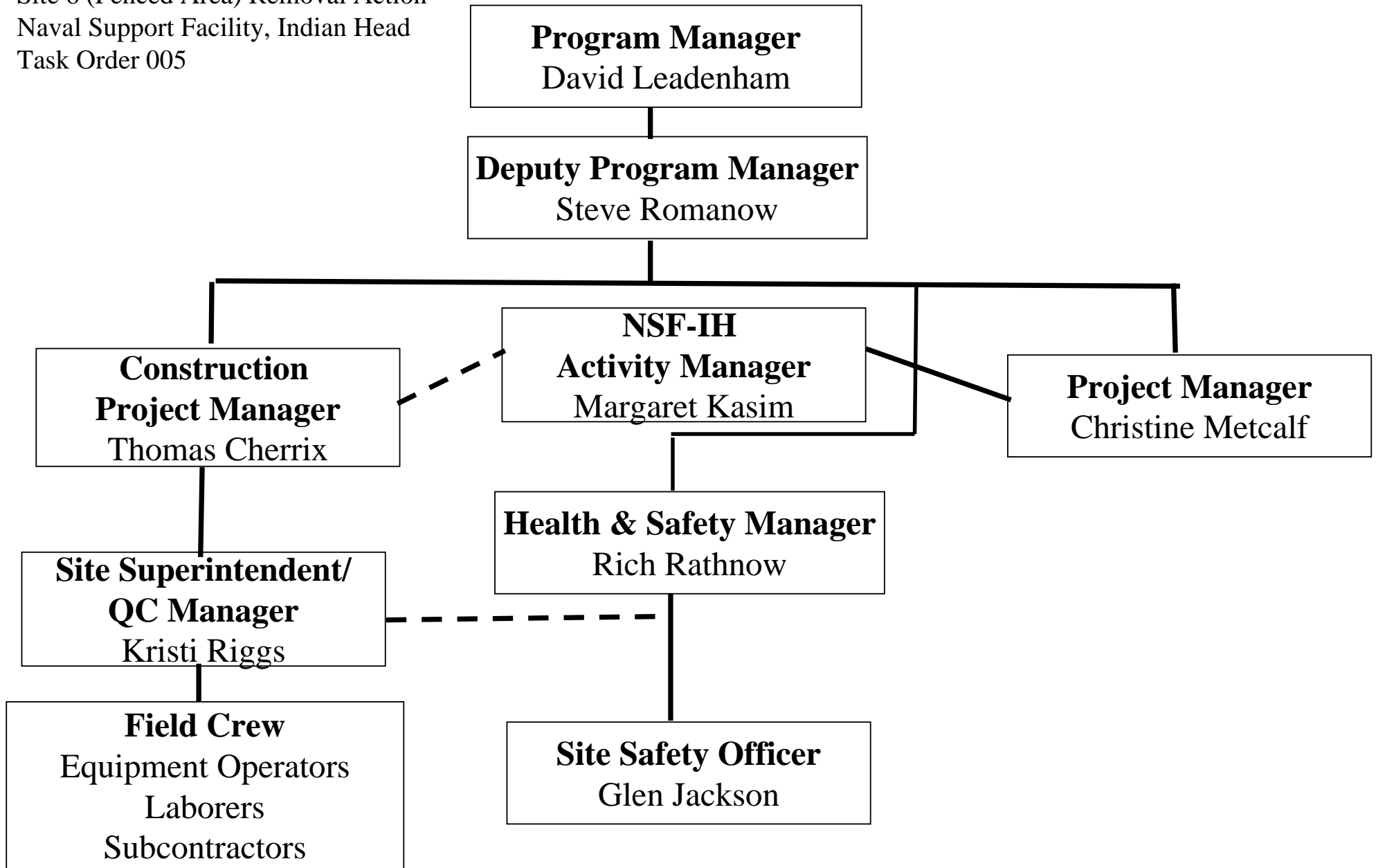
The JVIII site supervisor will be responsible for preparing a field activity summary that describes the work performed each day. This information will be summarized on a weekly basis by the project manager and provided to the Navy and the FEAD.

The summarized information will be included in the post RA report, which will document that the SOW is complete and which will also include the following information:

- A description of the RA activities, including field notes and daily logs, and QC reports
- Photographs
- Chronology of significant events that occurred during the project
- Documentation of transport and disposal of all materials
- Problems encountered
- Conclusions

## Figure 5-1 – Organizational Chart

Site 6 (Fenced Area) Removal Action  
Naval Support Facility, Indian Head  
Task Order 005



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## Appendix A

### Project Schedule

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TASK ORDER-005  
Site 6 (Inside Fenced Area) Removal Action  
NSF-IH, Indian Head, Maryland

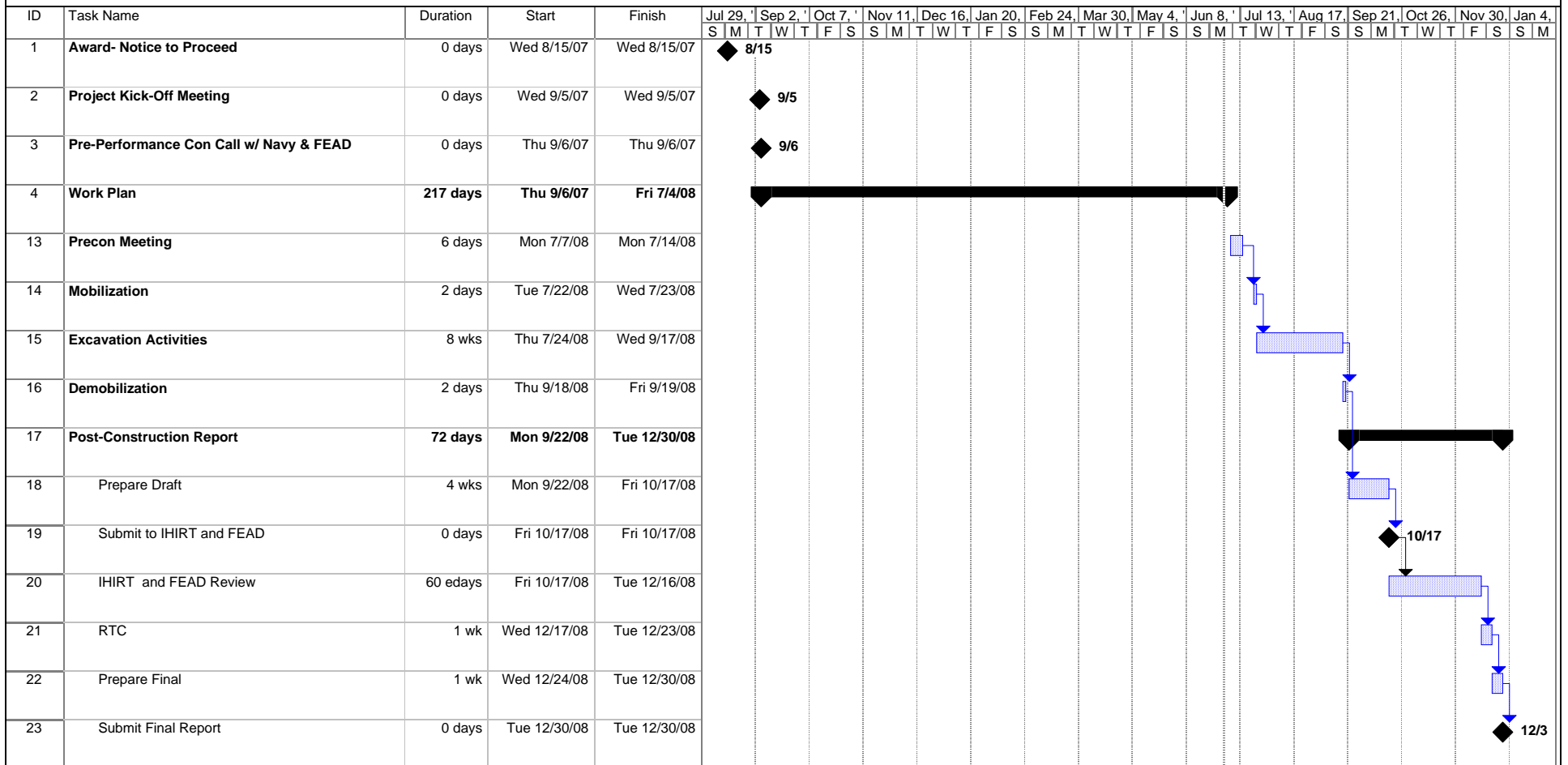
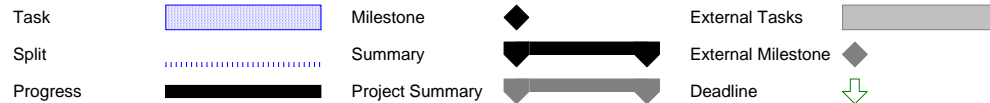


Figure 2-1  
Project Schedule  
Indian Head-Site 6-Removal Action



## Appendix B

# Excavation and Material Handling Plan

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# Excavation and Material Handling Plan

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This excavation and material handling plan describes the waste management requirements and procedures for the implementation of the Site 6 removal action at Naval Support Facility, Indian Head (NSF-IH), in Indian Head, Maryland. The site excavation activities are described in Section 4 of the work plan.

The following activities are anticipated to generate waste:

- Cleared vegetation (debris generated from site clearing for laydown and construction areas)
- Non-hazardous soil (soil impacted with silver from the excavation area)
- Contaminated sampling equipment and personnel protective equipment (PPE) (used during excavation activities; characterized as non-hazardous waste)
- Uncontaminated construction waste (caution tapes, barricades, signs, packing materials; non-hazardous waste stream to be disposed in a Resource Conservation and Recovery Act [RCRA] Subtitle D Sanitary Landfill)

## B1. Regulatory Requirements

Wastes generated during all construction activities are expected to be non-hazardous. All wastes will be handled, staged, labeled, transported, and disposed in accordance with local, state, and federal regulations. Applicable local, state, and federal regulations governing the treatment, storage, transportation, and disposal of wastes may include the following:

- 40 Code of Federal Regulations (CFR) 263: RCRA standards applicable to hazardous waste transporters
- 40 CFR 268: RCRA land disposal restrictions
- 40 CFR 270: RCRA regulations controlling the transportation, manifesting, and disposal of hazardous waste
- 49 CFR 171-179: U.S. Department of Transportation (DOT) regulations on the packaging and shipping of hazardous materials and samples
- Hazardous Waste Management Regulations: RCRA standards applicable to generators of hazardous waste
- Maryland Department of the Environment (MDE) Solid Waste Regulations, Title 26, Code of Maryland Regulations (COMAR), Subtitle 4, Section 26.04.07

## B2. Waste Characterization

All wastes will be classified and managed in accordance with the applicable RCRA regulations. The soil and any associated groundwater from the excavated area will be classified as a non-hazardous waste under RCRA and COMAR regulations, and will be manifested and disposed offsite as a non-hazardous waste.

To facilitate the disposal of the excavated soils, sampling will be performed as part of the site removal action. A composite sample, consisting of eight grab samples collected across the extent of the entire excavation and homogenized into one sample, will be analyzed at an off-site laboratory for the following parameters:

- Full-suite Toxicity Characteristic Leaching Procedure (TCLP) – volatile organic compounds, semivolatile organic compounds, pesticides, herbicides, and metals
- Reactivity – cyanide and sulfur
- Corrosivity – pH
- Ignitability

Following review, the laboratory analyses will be forwarded to the Navy Technical Representative and the Facilities Engineering Acquisition Department (FEAD) if hazardous waste characteristics are detected. If the results confirm non-hazardous waste, as assumed in the statement of work for the removal action, the laboratory analytical results will be maintained onsite in the project trailer.

## B3. Waste Profile

As part of the waste acceptance process, waste characterization information will be documented on a waste profile form provided by the offsite treatment or disposal facility. Prior to offsite transportation of the material, an approved copy of the waste profile will be received, and the Navy will provide generator signature.

The waste profile will typically include the following information:

- Generator information, including name, address, contact, and phone number
- Site name, including street/ mailing address
- Activity generating waste (e.g., excavation of contaminated soils)
- Waste codes
- Source of contamination (e.g., silver-contaminated soils from former photographic operations)
- Physical state of waste (e.g., soil)

## B4. Waste Management

### B4.1 Waste Storage Time Limit

The excavated material is assumed to be non-hazardous waste. However, if hazardous waste is encountered, any hazardous waste stored on site will be removed within 90 days of generation. The date of generation is the date that the waste is first placed in a container or stockpile.

### B4.2. Labels

All containers, tanks, drums, and berms will be labeled; labels will be clearly visible and indicate either **hazardous** or **non-hazardous** waste, as applicable. Pre-printed labels will include the following information:

Accumulation Start Date  
Generator Name: Navy  
EPA ID Number: MD4170024109  
Waste-Specific Information (e.g., contaminated soil)

Drums will be labeled as shown below. A drum number should be obtained from Shawn Jorgensen in the NSF-IH environmental office. An example of the labeling for non-hazardous waste in a 55-gallon drum is provided below:

Shipping Name: Non-Hazardous Waste Solid -or- Liquid (one or the other)

Removal Action Wastes  
Matrix: (indicate Solid, Liquid, or PPE)  
NSF-IH JV3 Removal Action--Site 6  
Contract No. N40080-07-D-0301  
TO-005  
(Insert the date)  
Onsite contact: (301) 744-2263

Using the following label:



If hazardous waste is detected and requires disposal, the specifications in 40 CFR 260-265 will be used for proper identification and labeling.

It must be noted that the Waste Handling Manifest must match the shipping manifest(s), whether liquid or solid. If the manifest does not match the label, a discrepancy must be noted in Section G of the manifest and the transporter has the right to refuse shipping the load.

### **B4.3 Waste Management Area Requirements**

Unless the Navy designates a specific waste storage area, wastes will be accumulated and stored near the project site in specific storage areas with appropriate designation/signage and security. These waste storage areas will be under the control of the AGVIQ-CH2M HILL Joint Venture III (JVIII). All wastes will be contained in a manner that prevents the spread of contamination. Based on the removal action activities and the types and levels of contaminants present, none of these waste residues are expected to represent a significant risk to human health or the environment if properly managed. Planned management of these wastes is outlined in the following subsections.

- Cleared vegetative waste will remain onsite (non-hazardous waste).
- Contaminated soil will be staged in stockpiles (non-hazardous waste).
- Decontamination water will be contained in 55-gallon drums or accumulated in portable tanks (i.e., frac tanks).
- Nuisance water and dewatering groundwater from the saturated soils and/or the excavation will remain onsite (non-hazardous waste).
- Contaminated sampling equipment, PPE, and other debris will be contained in drums (non-hazardous waste).
- Uncontaminated general construction debris will be placed in containers or placed in storage piles, pending offsite disposal (non-hazardous waste).

#### **Portable Tanks**

Portable tanks, if used, will be managed as follows:

- Tanks will be inspected upon arrival for signs of deterioration and contamination. Any tank arriving onsite with contents will be rejected.
- Tanks will be provided with port/access covers and locking.
- Each tank will be labeled.
- All tanks will be provided with secondary containment (as needed).

#### **Stockpiles**

The following procedures will be followed when using stockpiles:

- Stockpiled soil will be provided with secondary containment (i.e., a liner, a perimeter berm to prevent rupture and release or infiltration of liquids, and a cover).

- Minimum 20 millimeter polyethylene sheeting will be used for liners and covers.
- The perimeter berm, typically hay bales or earth placed beneath the liner, will be constructed to collect any liquids draining from the stockpile.
- Contaminated liquids that accumulate in the secondary containment will be pumped (or otherwise removed) a minimum of once a day to a container or tank or across the site through filter bags, as needed.
- Covers and perimeter berms will be secured in place when not in use and at the end of each work day, or as necessary to prevent wind dispersion or run-off from major precipitation events.
- Construction materials for the stockpiles that contact waste will be disposed of as contaminated debris, in the same manner as the soil.
- Accumulation start dates will be recorded on a log or a sign located at the stockpile.

All wastes storage and satellite waste storage areas will be compliant with the MDE Solid Waste Regulations, Title 26, COMAR Subtitle 4, Section 26.04.07, including any pre-trip requirements in 49 CFR 571 and 40 CFR 263.

## B5. Waste/Fuel Storage Area Inspections

Areas used for waste/container storage will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release, and inspections will be recorded. The following inspection schedule will be followed:

- Minimum weekly inspection of containers, tanks, roll-offs, stockpiles, and applicable secondary containment systems for leaks, spills, signs of corrosion, or signs of general deterioration or releases
- Minimum weekly inspections of fuel storage areas (e.g., look for eroding containment systems and rusting tanks/ancillary equipment)
- Waste storage areas will be inspected weekly, at a minimum. If operations are suspended for more than 7 days, alternate inspection arrangements will be made, such that waste storage areas are inspected on the same schedule or all wastes and materials are removed from the site. Inspections will be recorded in the Contractor Quality Control Report, and copies of the report will be maintained onsite and available for review.

All waste storage area inspections will be compliant with the MDE Solid Waste Regulations, Title 26, COMAR Subtitle 4, Section 26.04.07.

## B6. Waste Transportation

Each transportation vehicle and load of waste will be inspected before leaving the site. The quantities of waste leaving the site will be recorded. A contractor licensed for commercial transportation will transport the non-hazardous wastes; a contractor licensed for transport of hazardous waste will transport the hazardous waste, if encountered at the site. Prior to



the transport of any waste material, a copy of the documentation indicating the transporter has the appropriate licenses will be received.

### **B6.1 Manifests/Shipping Documentation**

Each load of waste material will be appropriately manifested before leaving the site. At a minimum, the manifest form will include the following information:

- Transporter information, including name, address, contact, and phone number
- Generator information, including name, address, contact, and phone number
- Site name, including street/ mailing address
- Description of waste
- Type of container
- Quantity of waste (volumetric estimate)

Additionally, each shipment of waste will have a waste profile and haul ticket. If the signed waste manifest form from the designated offsite disposal facility is not received within 35 days, the JVIII will contact the transporter or designated disposal facility to determine the status of the waste.

### **B6.2 Transporter Responsibilities**

In general the transporter will be responsible for weighing loads of waste at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container or tanker truck for aqueous waste. Disposal quantities will be based on the difference of the weight measurements between the full and empty container or tanker truck. Weights will be recorded on the shipping documentation. The transporter will provide copies of the weight tickets with the final manifest to the JVIII.

The transporter will observe at a minimum the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic
- Repair road damage caused by hauling or transportation
- Clean up materials spilled in transit
- Line and cover trucks/trailers used for hauling contaminated materials to prevent releases
- Decontaminate vehicles prior to re-use, other than hauling contaminated material
- Lock and seal trucks transporting liquids with a tracking code prior to transport from the site

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the Health and Safety Plan (Appendix D). No materials from other projects will be combined with materials from this project.

### B6.3 Transportation and Disposal Log

Waste transportation will be inventoried the day of transportation from the site using the Transportation and Disposal Log. A carbon copy of the initial manifest form for each load will be retained on-site and attached to the Daily Production Report. All required transportation manifests will be prepared by the JVIII and signed by the Navy representative.

All transporter requirements will be compliant with the MDE Solid Waste Regulations, Title 26, COMAR Subtitle 4, Section 26.04.07, including any pre-trip requirements in 49 CFR 571 and 40 CFR 263.

## B7. Waste Disposal

Offsite treatment or disposal facilities will use the waste profile and supporting documentation to determine if they will accept the waste. The treatment or disposal facility will be responsible for providing a copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received.

Contaminated soil from the excavated area, which is non-hazardous, will be shipped for offsite disposal to the following facility:

- To be determined (TBD) after receipt of waste characterization results

Based on the laboratory analytical results and the quality of the soil removed from the site, the excavated material may meet the criteria for Alternative Daily Cover (ADC) at a RCRA Subtitle D Sanitary Landfill.

Contaminated sampling equipment or PPE, which are non-hazardous wastes, will be shipped for offsite disposal to the following facility:

- Charles County Landfill

Uncontaminated construction waste (such as caution tapes, barricades, signs, packing materials or other construction debris) will be disposed at the following facility:

- RCRA Subtitle D Sanitary Landfill, Charles County Landfill

All cleared vegetative waste will remain onsite. JVIII will coordinate with the FEAD to dispose of the vegetative waste at NSF-IH.

## Appendix C

### Quality Assurance Plan

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### Site QC Representative Appointment Letter

Kristi Riggs  
AGVIQ-CH2M Hill Joint Venture III  
4610 Westgrove Court  
Virginia Beach, VA 23455

RE: N40080-07-0301-62470-D-0301 / T.O. 05 Site 6 QC Manager

Dear Ms. Riggs,

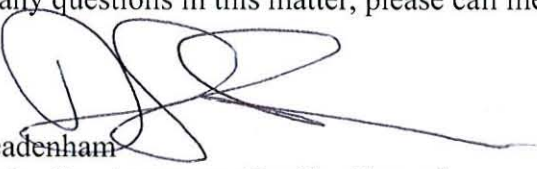
This letter will serve as your appointment as the Site Quality Control Manager on the referenced project and will also clarify your duties and authority in this position. In this position, you will be authorized to use available resources to satisfy all applicable requirements of the Program and Task Order T.O. 5 Quality Control Plan.

This authorization specifically gives you the authority to direct removal and replacement or correction of nonconforming materials or work and stop work authority when continuation would be unsafe to personnel, harmful to the environment, or result in a significant degradation of quality.

You will be expected to work closely with the Project Manager and other project personnel, but you will not be directly responsible to anyone but myself for resolution of quality issues when working in the capacity of Quality Control Manager.

If you have any questions in this matter, please call me.

Sincerely,

  
David R. Leadenham  
Manager of Quality Assurance/Quality Control  
JVIII



PROFESSIONAL DEVELOPMENT SUPPORT CENTER  
HUNTSVILLE, ALABAMA

## **CERTIFICATE**

*This is to certify that*

**Kristi Riggs  
AGVIQ, LLC**

*has completed the Corps of Engineers Training Course*

## **CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS**

THIS CERTIFICATE, CENAO-07-0444 EXPIRES 27 September 2012

Given at New Bern, NC By Norfolk 27 September 2007  
Location Instructional District Date

  
James R. Baldwin, P.E.  
Facilitator

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

  
Chief, USACE Professional Development Support Center

# Quality Assurance Plan

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This Quality Assurance Plan (QAP) details the quality administrators and the project organization for the work to be completed for Task Order (TO) 005 under the AGVIQ-CH2M HILL Joint Venture III (JVIII), and the definable features of the removal action at Site 6, at Naval Support Facility, Indian Head (NSF-IH), in Indian Head, Maryland.

The site specific project organization chart (Figure 5-1 in the work plan) depicts the organizational chain of command for this TO, and the individuals responsible for executing the work as indicated. Individual roles and responsibilities of TO personnel are summarized in Table 5-1 of the work plan.

## C1. Implementation of Quality Assurance Plan

The site superintendent will act as the Project Quality Control (QC) Manager to ensure compliance with the tasks listed below. The QC Manager will implement the QAP, and is the manager of all QC activities.

The QC Manager is the manager of all QC activities; and is required to conduct QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed, and provide the QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by the QC specialists, testing laboratory personnel, and any other inspection and testing personnel required by this contract.

No construction work or testing may be performed unless the QC Manager or representative is on the work site. The Site QC Manager shall report to an officer of JV III.

## C2. Construction Inspection and Control

The definable features of work for removal action activities included in this work package are detailed in Section 4 of the work plan and constitute the individual elements that comprise pre-construction, construction, and post-construction activities. The construction inspection and control of the definable work is per the statement of work (SOW) and the work plan. It must be noted, the QC role is the last series of checks and balances that will institute the billing cycle for activities completed onsite. The billing will be conducted following the approved schedule of values; therefore, the QC Manager will report any deficiencies or issues to the Construction project manager (PM) for resolution to prevent billing cycle delays. Any resolutions that involve NSF-IH Facilities Engineering Acquisition Department (FEAD) interaction will be conducted as a meeting, if necessary.

## C2.1 Pre-Construction Activities (Control Phase # 1)

As part of the pre-construction activities, a pre-construction meeting will be held to review the project preparedness, removal action requirements, procedures, and the schedules. Tasks included in pre-construction activities are summarized below:

Task	Inspection/Construction Control
Pre-Excavation Disposal Characterization	Verification of the following: <ul style="list-style-type: none"> <li>• Receipt of analytical data for waste profile</li> <li>• Acceptance of excavated materials for disposal</li> </ul>
Utility Clearance	Verification of the following: <ul style="list-style-type: none"> <li>• Utilities cleared by Miss Utility of Maryland</li> <li>• Utility mark-out performed by NSF-IH</li> <li>• Utility mark-out performed by third-party subcontractor (to the JV)</li> <li>• Field inspection completed to observe mark-outs</li> </ul>
Haul Route Review	Verification of the following: <ul style="list-style-type: none"> <li>• Haul route has been identified and designated.</li> <li>• Entire on-site route has been observed and deficiencies documented through digital photograph.</li> </ul>
Pre-Construction Meeting	Verification of the following: <ul style="list-style-type: none"> <li>• Discussion of project scope, schedule, health and safety concerns, QC procedures, and logistical issues.</li> </ul>
Pre-Construction Submittals	Verification of the following: <ul style="list-style-type: none"> <li>• Approval of Erosion and Sediment Control Plan (ESCP)</li> <li>• Submission of final work plan to Navy</li> <li>• Receipt of subcontractor personnel qualification and certifications</li> <li>• Receipt of subcontractor plans (if required).</li> </ul>
Mobilization	Verification of the following: <ul style="list-style-type: none"> <li>• Establishment of lay down area</li> <li>• Staging of site trailer</li> <li>• Utility hookup for office trailer and set up of sanitation facilities</li> <li>• Receipt of site preparation materials</li> <li>• Establish Haul Route with signage and route maps approved by the FEAD and NSF-IH personnel</li> </ul>
Site Preparation	Verification of the following: <ul style="list-style-type: none"> <li>• Installation of erosion and sediment control features per plan and maintain with daily inspections.</li> <li>• Security personnel informed of site activities</li> <li>• Installation of appropriate signage for site activities and hauling routes</li> <li>• Monitoring well abandonment in accordance with MDE regulations.</li> <li>• Construction of waste staging areas</li> <li>• Construction of soil staging areas</li> <li>• Establishment of environmental exclusion zones</li> <li>• Set up of decontamination area for equipment</li> <li>• Set up of equipment staging area</li> <li>• Security/Construction Fence installation around the excavation</li> </ul>

Task	Inspection/Construction Control
Surveying	Verification of the following: <ul style="list-style-type: none"> <li>• Surveyor qualifications/license</li> <li>• Existing monuments and structures</li> <li>• Instrument calibration and accuracy</li> <li>• Reference to applicable plane coordinates and vertical datum</li> <li>• Location of excavated area</li> <li>• Install control points for excavation activities</li> </ul>
Site Clearing	Verification of the following: <ul style="list-style-type: none"> <li>• Limits of site clearing</li> <li>• Environmental protection measures (erosion and sediment controls)</li> <li>• Collection, staging and management of vegetative debris conducted in accordance with the work plan.</li> <li>• Determine if tree protection is required</li> </ul>
Spill Prevention	Verification of the following: <ul style="list-style-type: none"> <li>• Periodic visual inspection for signs of drips, leaks, or stains from heavy equipment</li> <li>• Spill prevention and containment available for spills up to 100 gallons</li> <li>• Subcontractor identified with spill response capability</li> <li>• Equipment tested and maintained to ensure proper operation</li> </ul>

## C2.2 Construction Activities (Control Phase # 2)

The following quality controls will be implemented during the construction activities:

Task	Inspection/Construction Control
Excavation	<ul style="list-style-type: none"> <li>• Verify extent of excavation using horizontal measurements.</li> <li>• Verify vertical and horizontal control – depth below ground surface for removal and staging of soils.</li> <li>• Production rates through excavator bucket loads</li> <li>• Set up and inspection of dewatering equipment, verify in good working order.</li> </ul>
Excavated Soils	Verification of the following: <ul style="list-style-type: none"> <li>• Placement of excavation spoils on 20 millimeter polyethylene sheeting</li> <li>• Construction of perimeter berms and secondary containment</li> <li>• Material lay down areas, run-on and run-off control</li> <li>• Placement of stockpiles at least 2 ft from excavation is accordance with OSHA regulations.</li> <li>• Uncontaminated soils stockpiled separately for re-use.</li> <li>• Staging of equipment in approved staging areas</li> <li>• Water regularly pumped from secondary containment areas into frac tank or onto ground surface, as required.</li> </ul>



## C2.3 Post Construction Activities (Control Phase # 3)

The following quality controls will be implemented during post construction activities:

Task	Inspection/Construction Control
Placement of Backfill	<p>Verification of the following:</p> <ul style="list-style-type: none"> <li>Analytical results for off-site backfill to ensure material is clean</li> <li>Offsite material gradation and type for compliance with specifications</li> <li>Backfill with saturated soils occurs first.</li> <li>Compaction of backfill-following SOW and work plan requirements</li> <li>Elevation of backfilled area is recorded through surveying by onsite personnel and recorded on construction drawings</li> </ul>
Waste Management-All activities preformed in this task will follow the Waste Management Plan.	<p>Verification of the following:</p> <ul style="list-style-type: none"> <li>Prior to offsite transportation, approved copy of waste profile received, and checked for completeness and correctness.</li> <li>Waste accumulation start dates recorded in a log and on a visible sign</li> <li>Removal of waste within 90 days of generation</li> <li>All containers, tanks, drums, and berms are clearly and appropriately labeled in accordance with all federal, state, and local regulations.</li> <li>Secondary containment established for portable tanks, stockpiles used for waste, or container storage, as needed.</li> <li>Drum number obtained from the NSF-IH environmental office</li> <li>Weekly inspection of waste/fuel storage areas using daily inspection sheets.</li> <li>Contaminated soil staged in stockpiles and inspected weekly</li> <li>Decontamination water stored in 55-gallon drums or in frac tanks</li> <li>Nuisance water and groundwater from dewatering pumped into frac tanks or onto ground surface</li> <li>Contaminated sampling equipment, PPE, and other contaminated debris stored in drums</li> <li>Segregation and containment of uncontaminated debris</li> <li>Each load of waste inspected before leaving site and quantity recorded</li> <li>Review of waste transporter licenses</li> <li>Shipping Manifests signed by transporters as receipt of initial waste manifest attached to daily production report, to be followed up with a call to the designated TSDF with a verbal receipt documented on a Phone Log/daily report. The TSDF will be required to submit a status sheet of all waste-loads received and accepted for Treatment at the facility each week and checked by the JVIII QC Manager</li> </ul>
Site Restoration	<p>Verification of the following:</p> <ul style="list-style-type: none"> <li>Restoration methods and limits verified by the survey control points and the documented on the construction drawings.</li> <li>Material/Product quality (supplier certifications): seed, erosion control matting, mulch, fertilizer (if required).</li> <li>Surface preparation-stabilization, repair silt fence and maintain until soil stabilization occurs at the site.</li> <li>Material application (casting) rates</li> <li>Watering and maintenance</li> <li>Damage repair (washouts, asphalt, road swept)</li> </ul>

Task	Inspection/Construction Control
Site Clean-Up and Demobilization	<p>Verification of the following:</p> <ul style="list-style-type: none"> <li>• Decontamination of all equipment</li> <li>• Removal of all support equipment, staging materials, waste materials, heavy equipment</li> <li>• Removal of E&amp;S controls if possible, may be needed for soil stabilization.</li> <li>• Prepare site inspection and develop punch list items</li> <li>• Resolution of punch list items</li> <li>• Final site inspection and punch list with the FEAD</li> <li>• Orderly site demobilization</li> </ul>

### C3. Outside Organizations

Outside organizations such as subcontractors employed by JV III for work under this task order is provided in Attachment D-1, which lists each firm's name and address and describes the services each firm will provide. This list will be maintained current and will be available for review by the QC Manager.

### C4. Submittal Register

The initial Submittal Register is provided as Attachment D-2. The status of each submittal will be recorded. The Submittal Register will be maintained and submitted at the end of each month.

### C5. Testing Plan and Log

Testing laboratory accreditation requirements are addressed in the JV III contract, which governs TO 005. Construction materials-testing laboratories performing work for Navy construction contracts must be accredited by one of the laboratory accreditation authorities. The laboratory's scope of accreditation must include the ASTM standards listed in the paragraph titled "Construction Materials Testing Laboratory Requirements" as appropriate to the testing field. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

A Testing Plan and Log has been prepared for the TO and is provided as Attachment D-3.

### C6. Rework Items

Should rework items be necessary, they will be documented on the Daily QC Report and on the Rework Items List (Attachment D-4). This will be used to track and report rework items, and will be submitted on a monthly basis.

## C7. Documentation Procedures

As outlined within the work plan, the site supervisor will be responsible for preparing a field activity summary that describes the work performed each day. Attached to this daily field activity summary will be the Daily QC Report and the Contractor Production Report. The schedule for documentation is presented below:

Report	Frequency
Field Activity Summary (inc. QC report, Contractor Production report)	Daily
QC Meeting Agenda	Biweekly
QC Meeting Minutes	Biweekly
Submittal Register	Monthly
Rework Items	Monthly
Testing Plan and Log	Monthly

ATTACHMENT C-1

Approved Consultant and Subcontractor List

Company Name and Address	Description of Services Provided
Accumark, Inc.	Utility locator
Patton, Harris, Rust & Associates	Surveyor
Parratt-Wolff, Inc.	Driller (well abandonment)
CompuChem	Laboratory (analytical)
ECS Mid-Atlantic, LLC	Laboratory (geotechnical)
Earthcare Solutions, Inc	Transportation
Charles County Landfill	Disposal facility
Chaney Enterprises	Fill material source

<b>Attachment C-2</b> <b>SUBMITTAL REGISTER</b>	CONTRACT NO. <b>N40080-07-D-0301</b>
--	---

CONTRACT NO.  
**N40080-07-D-0301**

TITLE AND LOCATION	CONTRACTOR
NSF-IH Site 6 (Fenced Area) Removal Action, Indian Head, Maryland	Agvig - CH2M HILL Joint Venture III

CONTRACTOR
<b>Agvig - CH2M HILL Joint Venture III</b>

[illegible]

**Attachment C-3**  
**TESTING PLAN AND LOG**

CONTRACT NO.  
**N40080-07-D-0301**

TITLE AND LOCATION	
NSF-IH Site 6 (Fenced Area) Removal Action, Indian Head, Maryland	

CONTRACTOR  
Agviq - CH2M HILL Joint Venture III

[illegible]

## Attachment C-4 REWORK ITEMS LIST

CONTRACT NO.  
**N40080-07-D-0301**

**TITLE AND LOCATION**  
**NSF-IH Site 6 (Fenced Area) Removal Action, Indian Head, Maryland**

CONTRACTOR  
**Agvig - CH2M HILL Joint Venture III**

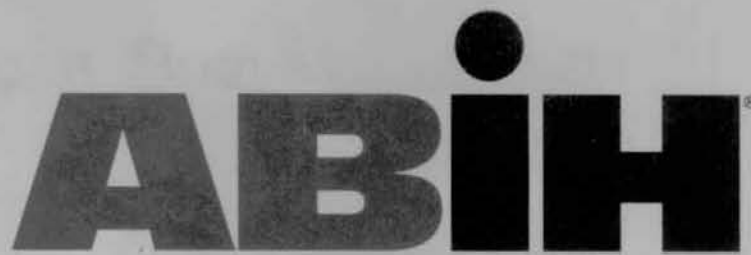
[illegible]

## Appendix D

### Health and Safety Plan

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proclaims that

*Richard N. Rathnow*

having met all requirements through  
education, experience and examination,  
is hereby certified in the

**COMPREHENSIVE PRACTICE  
of  
INDUSTRIAL HYGIENE**

and has the right to use the designations

**CERTIFIED INDUSTRIAL HYGIENIST**

**CIH**

Certificate Number: 6813 CP

Awarded: July 21, 1995

Expiration Date: June 1, 2012

*Barbara J. Dawson*  
Chairman ABIH

*Lynn C. O'Donnell*  
Executive Director ABIH

# **Health and Safety Plan Removal Action Work Plan for Site 6 (Fenced Area)**

**Naval Support Facility, Indian Head  
Indian Head, Maryland**

**Task Order 005**

**March 2008**

Prepared for

**Department of the Navy  
Naval Facilities Engineering Command Washington**

Under the

**JVIII Program  
Contract N40080-07-D-0301**

Prepared by



**AGVIO –CH2M HILL  
Joint Venture**

# Contents

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<b>Acronyms and Abbreviations .....</b>	<b>vii</b>
<b>1.0 Introduction .....</b>	<b>1-1</b>
1.1 NSF-IH Background .....	1-1
1.2 Site 6 Background .....	1-1
1.3 General Scope of Work .....	1-2
1.4 HAZWOPER-Regulated Tasks .....	1-3
1.5 Non-HAZWOPER-Regulated Tasks .....	1-3
1.6 Hazard Analyses .....	1-4
<b>2.0 Project Organization and Personnel .....</b>	<b>2-1</b>
2.1 Employee Medical Surveillance and Training .....	2-1
2.2 Project Safety Responsibilities .....	2-1
2.2.1 Key Safety Personnel .....	2-2
2.3 JVIII Subcontractors .....	2-4
<b>3.0 Project-Specific Hazards .....</b>	<b>3-1</b>
3.1 Adverse Weather .....	3-1
3.2 Constituents of Concern .....	3-2
3.2.1 Potential Routes of Exposure .....	3-2
3.3 Radiological Hazards and Controls .....	3-2
3.4 Clearing and Grubbing-General .....	3-3
3.4.1 Site Clearing - Tree Felling .....	3-3
3.4.2 Site Clearing - Chainsaws/Brush Cutters .....	3-4
3.4.3 Site Clearing - Chippers .....	3-5
3.4.4 Machine Guarding .....	3-6
3.5 Cranes .....	3-6
3.6 Demolition .....	3-6
3.7 Drilling Safety .....	3-6
3.8 Electrical Safety .....	3-6
3.9 Excavation Activities .....	3-7
3.10 Fire Prevention .....	3-8
3.11 Flight Line Safety - General .....	3-9
3.12 Hand and Power Tools .....	3-9
3.13 Haul Trucks .....	3-10
3.14 Heavy Equipment .....	3-10
3.15 Ladders and Stairways .....	3-12
3.16 Lock-Out/Tag-Out .....	3-12
3.17 Manual Lifting .....	3-12
3.18 Noise .....	3-12
3.19 Pressure Washing Operations .....	3-13
3.20 Sample Handling .....	3-13
3.20.1 IDW Drum Handling or Sampling .....	3-14
3.21 Unknown or Unanticipated Buried Objects .....	3-15
3.21.1 UXO/MEC (Avoidance) .....	3-15

3.22	(Exposure to) Vehicular Traffic .....	3-15
3.23	Visible Lighting .....	3-16
3.24	Working Around Material Handling Equipment .....	3-17
3.24.1	Rigging.....	3-18
3.24.2	Suspended Loads .....	3-18
3.24.3	Powered Industrial Trucks .....	3-18
3.25	Working Above or Near Water .....	3-19
3.26	General Hazards.....	3-19
3.26.1	General Practices and Housekeeping.....	3-19
3.26.2	Hazard Communication.....	3-19
3.26.3	Shipping and Transportation of Chemical Products .....	3-20
3.26.4	Heat Stress.....	3-20
3.26.5	Monitoring Heat Stress.....	3-21
3.26.6	Cold Stress.....	3-21
3.27	Procedures for Locating Buried Utilities .....	3-22
3.28	Biological Hazards and Controls .....	3-23
3.28.1	Snakes .....	3-24
3.28.2	Poison Ivy, Oak, and Sumac.....	3-25
3.28.3	Ticks .....	3-26
3.28.4	Bees and Other Stinging Insects.....	3-26
3.28.5	Bloodborne Pathogens.....	3-26
3.28.6	Mosquito Bites .....	3-26
3.28.7	Brown Recluse Spiders .....	3-27
3.28.8	Widow Spiders .....	3-28
3.28.9	Rabid Animals .....	3-29
3.28.10	Fire Ants .....	3-30
<b>4.0</b>	<b>Behavior Based Loss Prevention System.....</b>	<b>4-1</b>
4.1	Activity Hazard Analysis.....	4-1
4.2	Pre-Task Safety Plans.....	4-2
4.3	Loss Prevention Observations.....	4-2
4.4	Loss/Near-Loss Investigations .....	4-2
<b>5.0</b>	<b>JVIII Personal Protective Equipment.....</b>	<b>5-1</b>
<b>6.0</b>	<b>Air Monitoring/Sampling.....</b>	<b>6-1</b>
6.1	Air Monitoring Specifications .....	6-1
6.2	Calibration Specifications .....	6-3
<b>7.0</b>	<b>Decontamination.....</b>	<b>7-1</b>
7.1	Decontamination Specifications.....	7-1
7.2	Diagram of Personnel-Decontamination Procedures .....	7-1
<b>8.0</b>	<b>Spill-Containment Procedures .....</b>	<b>8-1</b>
8.1	Procedure for Containing/Collecting Spills .....	8-1
<b>9.0</b>	<b>Site-Control Plan.....</b>	<b>9-1</b>
9.1	Site-Control Procedures - General .....	9-1
9.2	Specific Site Control Measures .....	9-2
9.2.1	Exclusion Zone .....	9-2

9.2.2	Contamination Reduction Zone .....	9-3
9.2.3	Support Zone.....	9-3
9.3	HAZWOPER Compliance Plan .....	9-3
<b>10.0</b>	<b>Emergency Response Plan .....</b>	<b>10-1</b>
10.1	Pre-Emergency Planning - General.....	10-1
10.2	Emergency Equipment and Supplies .....	10-1
10.3	Incident Reporting, Investigation and Response .....	10-2
10.4	Emergency Medical Treatment.....	10-3
10.5	Evacuation .....	10-3
10.6	Evacuation Signals.....	10-7
10.7	Incident Notification and Reporting.....	10-7
<b>11.0</b>	<b>Approval.....</b>	<b>11-1</b>
11.1	Original Plan .....	11-1
11.2	Revisions .....	11-1
<b>12.0</b>	<b>Site Specific Maps/Figures .....</b>	<b>12-1</b>

## Tables

1-1	Activity Hazard Analysis .....	1-4
3-1	Constituents of Concern .....	3-2
5-1	Personnel Protective Equipment .....	5-1
6-1	Air Monitoring Equipment Specifications .....	6-1
6-2	Air Monitoring Equipment Calibration Specifications .....	6-3

## Figures

7-1	Personnel Decontamination Line .....	7-3
10-4	Hospital Route Map .....	10-5
10-7	JVIII Incident Reporting Process .....	10-9

## Attachments

1	Employee Signoff Form
2	Subcontractor H&S Tracking Form
3	Project H&S Forms/Permits
4	Project Activity Self-Assessment Checklists
5	Drug Free Work Place Program
6	Material Safety Data Sheets
7	Chemical-Specific Training Form
8	Project-Specific Chemical Product Hazard Communication Form
9	Biological Hazard Fact Sheet
10	Activity Hazard Analyses (AHAs)
11	Pre-Task Safety Plan (PTSP)
12	Loss Prevention Observation (LPO) Form
13	Loss/Near Loss Incident Report Form
14	Emergency Contact List
15	Site Specific Accident Prevention Plan

# Acronyms and Abbreviations

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AHA	Activity Hazard Analysis
amsl	above mean sea level
ASTM	American Society for Testing and Materials
BBLPS	Behavior Based Loss Prevention System
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
COC	constituent of concern
CPR	cardiopulmonary resuscitation
CSE	confined space entry
DPT	Direct Push Technology
EO	explosive ordnance
EEA	explosive experimental area
EE/CA	Engineering Evaluation/Cost Analysis
ESC	Erosion & Sediment Control
FA	First Aid
ft	feet
GFCI	ground fault circuit interrupter
H&S	Health and Safety
HAZWOPER	Hazard Waste Operations
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDW	Investigation Derived Waste
IRA	Interim Removal Action
IRF	Incident Report Form
JVIII	AGVIQ-CH2M HILL Joint Venture III
LPO	Loss Prevention Observation
MDE	Maryland Department of the Environment
MEC	Munitions of Explosive Concern
MSDS	Material Safety Data Sheet
NAVFAC	Naval Facilities Engineering Command
NLI	Near Loss Investigation
NPL	National Priorities List
NSC	National Safety Council
NSF-IH	Naval Support Facility Indian Head

NTCRA	Non-time Critical Removal Action
NTR	Navy Technical Representative
PPE	Personal Protective Equipment
PTSP	Pre-Task Safety Plan
RA	Removal Action
RAO	Removal Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RMSF	Rocky Mountain Spotted Fever
ROD	Record of Decision
ROICC	Resident Officer in Charge of Construction
SHSO	Site Health and Safety Officer
SOP	Standard of Practice
SWO	Stop Work Order
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

# 1.0 Introduction

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This Health and Safety Plan (HSP) was prepared for Naval Facilities Engineering Command (NAVFAC) Washington by CH2M HILL and AGVIQ under the Joint Venture III (JVIII), Contract No. N40080-07-D-0301, Task Order (TO) 005, as part of a removal action work plan for a non-time critical removal action (NTCRA) for Site 6 (Fenced Area) at Naval Support Facility, Indian Head (NSF-IH) in Indian Head, Maryland.

All site personnel, including JVIII and subcontractors, must review this HSP and sign the Employee Signoff Form (Attachment 1). In addition, the Site Health and Safety Officer (SHSO) will provide a safety briefing for all visitors to the site.

## 1.1 NSF-IH Background

NSF-IH is a United States Department of the Navy (Navy) facility located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, D.C. The facility consists of two tracts of land: the main area on Cornwallis Neck Peninsula and the Stump Neck Annex on Stump Neck Peninsula located across Mattawoman Creek from the main area (Figure 1-1 in the work plan).

The main area is approximately 2,500 acres and is bounded by the Potomac River to the northwest, west, and south; Mattawoman Creek to the south and east; and the town of Indian Head to the northeast. Included as part of the main installation are Marsh Island and Thoroughfare Island, which are located in Mattawoman Creek. Elevations range from sea level to approximately 125 feet above mean sea level (amsl).

The Stump Neck Annex is approximately 1,084 acres and is bounded by Mattawoman Creek to the northeast, the Potomac River to the northwest, and Chicamuxen Creek to the south-southwest. Elevations range from sea level to approximately 10 feet amsl.

Both the main installation and the annex are on the National Priorities List (NPL). They are separated by Mattawoman Creek (noncontiguous), have separate United States Environmental Protection Agency (USEPA) identification numbers, and perform dissimilar operations.

## 1.2 Site 6 Background

Site 6 consists of the area around Building 1349 (the former control building, currently used for storage), Building 1718 (the current control building), and Building 1140 (the radiographic accelerator building).

The topography at Site 6 is characterized to the north by a relatively steep hill on which Buildings 1350 and 1140 are located. The area from the hill to the south is moderately sloped. A drainage ditch extends south of Building 1718 to a low area in the southwest corner of the site where water tends to pond. In addition to the ditch discharging into this low area, storm water from areas offsite is carried by a culvert that crosses the access road



and discharges into this low area. The ditch then extends in an eastward direction from the low area to the fence line.

Soil underlying the site, as determined from boring logs for the three monitoring wells (IS06MW01, IS06MW02, and IS06MW03) installed during the remedial investigation consists of light brown to grey silty clay to clay at the near surface. The clay is underlain by sand or sand with silt, which may be interbedded with clay.

The water table, as determined from the monitoring wells installed at the site, ranges in elevation from about 17.0 feet above msl (monitoring wells IS06MW01 and IS06MW02) to 13.9 feet above msl (monitoring well IS06MW03). Based on these elevations, it appears that groundwater flow is to the east, which is consistent with the expected shallow groundwater flow toward surface drainages to the east, which then flow southward into Mattawoman Creek.

### 1.3 General Scope of Work

This NTCRA is being implemented by the Navy using their removal action authority under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and Executive Order 12580. The removal action objective (RAO) established in the Engineering Evaluation/Cost Analysis (EE/CA) for Site 6 (Fenced Area) (CH2M HILL, 2007) and associated action memorandum (NAVFAC Washington, 2007) is to remove and dispose of silver-contaminated surface soil and subsurface soil associated with the site to make sure that soil left in place does not represent an unacceptable risk to human health and the environment, and does not provide a continuing source of silver contamination to soil, sediment, and surface water beyond the fence.

To achieve the RAO, JVIII will:

- Remove and properly dispose of surface soil (0 to 1 foot below ground surface [bgs]) contaminated with unacceptable levels of silver to mitigate risks to ecological receptors and to mitigate the potential transport of silver from the surface soil to the soil and/or stream and sediment beyond the fence line. The vertical extent of silver contamination was characterized by the pre-excavation investigation described in the EE/CA (CH2M HILL, 2007); therefore, post-excavation confirmation sampling is not required.
- Remove and properly dispose of subsurface soil (down to a depth of 4 feet bgs) at sample locations IS06SS10 and IS06SD09 to mitigate unacceptable potential risk to construction workers and resident children based on a human health risk assessment performed for the site.
- Backfill the excavated area to existing grade and certify and record final elevations by compaction testing using American Society for Testing and Materials (ASTM) geotechnical testing standards. Perform a final horizontal and vertical survey of the site to confirm final elevations after backfill.
- Abandon three groundwater monitoring wells at the site in accordance with the Maryland Department of the Environment (MDE) groundwater well abandonment/closure regulations by a Maryland-certified well driller.

- Perform limited site feature restoration (repair to a drainage swale and installation of a metal culvert in the drainage ditch).

## 1.4 HAZWOPER-Regulated Tasks

Where certain work tasks include the handling, removal, containment, investigation or other physical site management of potentially hazardous wastes or materials or other regulated materials, execution of such tasks and the potential employee exposure to chemical hazards associated with these tasks may be regulated under 29 CFR 1910.120/29 CFR 1926.65. For this task order, the following activities will be considered Hazardous Waste Operations (HAZWOPER)-regulated tasks because of the potential worker exposure to site contaminants:

- Installation of Erosion & Sediment Control (ESC) features (if within NTRC limits)
- Land clearing (grubbing)
- Pre-characterization sampling (waste characterization)
- Excavation or handling of excavated soil, including particulate air monitoring and dust suppression operations, if needed
- Loading and transportation of soil
- Excavation dewatering activities
- Decontamination operations
- Air monitoring associated with the above activities

## 1.5 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-trained personnel. The following tasks are considered to be non-HAZWOPER regulated because they should not cause exposure to site constituents of concern (COC):

- Site mobilization/site preparation (non-intrusive activities)
- Land surveying and utility clearance
- Installation of ESC features (if outside of NTRC limits)
- Land clearing (tree removal)
- Site restoration: stream/ditch-line restoration, culvert pipe installation, and rip-rap rock installation
- Site restoration: backfilling/grading, seeding, etc.
- Demobilization

## 1.6 Hazard Analyses

Table 1-1 summarizes the hazards associated with the project tasks. Refer to Section 3.0 for controls for the project hazards.

TABLE 1-1  
Activity Hazard Analyses

Potential Hazards	Project Activities								
	Utility & Land Surveys (assumes no Potential Exposure)	Mobilization & Site Preparations (non intrusive only)	Installation of ESC	Land Clearing	Pre-characterization of Soil for Disposal (hand auger)	Soil Excavation & Management	Load and T&D of Soil	Site Restoration (Backfilling, Rip Rapp Install. Seeding, Install drainage pipe section @ 2-3' bgs)	Demobilization
Adverse Weather	X	X	X	X	X	X	X	X	X
Biological	X	X	X	X	X	X	X	X	X
Buried Utilities			X	X	X	X		X	
Chainsaws/Brushcutters			X	X					
Chemical Hazard-Dermal/Inhalation			X	X	X	X	X		
Compressed Gas Cylinders									
Concrete and Masonry									
Confined Space Entry (CSE)									
Cranes & Rigging (rigging only)									
Demolition									
Electrical Safety (HS-206)		X							
Drilling (DPT/HSA)									
Excavations (HS-307)						X		X	
Fire/Explosion Hazards									
Fire Prevention (HS-208)		X	X	X	X	X	X	X	X
Hand & Power Tools (HS-210)			X	X					
Haul Truck Operations		X				X	X		X
Heat Stress/Cold Stress	X	X	X	X	X	X	X	X	X
Heavy Equipment ( HS-306)			X	X		X	X	X	
Housekeeping	X	X	X	X	X	X	X	X	X
Ladders & Stairs									
Lockout /Tagout									
Manual Lifting (HS-112)	X	X	X	X	X	X		X	X
Material Handling Hazards		X		X		X	X	X	
Mechanical Guarding Hazards			X	X					
Munitions of Explosive Concern									
Noise (HS-108)		X	X	X	X	X	X	X	X
Pinch/Struck by/Caught In Between		X	X	X	X	X	X	X	X
Pressure Washing/Equip Decon (HS-506)						X	X		X
Pressurized Lines/Equipment									X
Slips/Trips/Falls	X	X	X	X	X	X	X	X	X
Suspended Loads				X		X	X	X	
Vehicle Traffic		X					X	X	X
Visible Lighting	X	X	X	X	X	X	X	X	X
Welding and cutting									
Working over water									

## 2.0 Project Organization and Personnel

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### 2.1 Employee Medical Surveillance and Training

The employees listed below are enrolled in a comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated “SSC” have completed a 12-hour site safety coordinator course or equivalent, and have documented requisite field experience. An SSC with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated “FA-CPR” are currently certified by the American Red Cross, or equivalent, in first aid and cardiopulmonary resuscitation (CPR). At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., CSE) and COCs (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in JVIII SOP HS-120, *Reproduction Protection*, including obtaining a physician’s statement of the employee’s ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SSC/FA-CPR
Dave Leadenham	AGVIQ	JVIII Program Manager	SC-A
Christine Metcalf	CH2MHILL	JVIII Project Manager	FA-CPR
Thomas Cherrix	AGVIQ	JVIII Project Manager	
Rich Rathnow	CH2M HILL	JVIII Health & Safety Manager	SC-HW, FA-CPR
Stephen Matney	AGVIQ	JVIII Technical Lead SHSO (Secondary)	SC-B, SSC-HW, FA-CPR
Jesse Cox	AGVIQ	JVIII Site Supervisor, SHSO (Primary)	SC-B, FA-CPR, SC-HW,
Brett Caron	AGVIQ	JVIII Field Team Member SHSO (Alternate)	SSC-B, SC-HW, FA-CPR
Glen Jackson	AGVIQ	JVIII HSO/POC	SSC-B, SC-HW, FA-CPR

### 2.2 Project Safety Responsibilities

The Project Manager has the overall responsibility for this project and will ensure that the requirements of the contract are attained in a manner consistent with this HSP and other contract-specific requirements. The Project Manager will coordinate with the SHSO to

ensure that the work is completed in a manner consistent with the HSP. The SHSO will be the main contact in any on-site emergency situation and will ensure off-site emergency agencies have been contacted prior to the start of work. The Health and Safety Manager (HSM) is responsible for formulating and reviewing the HSP and ensuring that the HSP is complete and accurate. The HSM also provides technical and administrative support for the JVIII Health and Safety Program and will be available for consultation when required. Each employee is responsible for personal safety as well as the safety of others in the work area.

### 2.2.1 Key Safety Personnel

The following individuals share responsibility for health and safety (H&S) at the site:

JVIII Program Manager - AGVIQ	Dave Leadenham	757-318-9420
JVIII Deputy Program Manager – CH2MHILL	Steve Romanow	703-376-5229
JVIII Project Manager – CH2MHILL	Christine Metcalf	703-376-5193
JVIII Project Manager – AGVIQ	Thomas Cherrix	757-417-5506 (cell)
JVIII Health and Safety Manager – CH2M HILL	Richard Rathnow	865-483 9005 x 572 865-607-6734 (cell)
JVIII Technical Lead-AGVIQ (SHSO-Secondary)	Stephen Matney	757-318-9420 x17
JVIII Site Supervisor –AGVIQ (SHSO-Primary)	Jesse Cox	757-449-9262 (cell)
JVIII SHSO (Alternate) –AGVIQ	Brett Caron	757-417-5716 (cell)
JVIII H&S Officer/POC – AGVIQ	Glen Jackson	757-318-9420 x 12 757-644-8293 (cell)

The JVIII Project Manager is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The Project Manager has overall management responsibility for the tasks listed below. The Project Manager may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this HSP.

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
  - Obtaining, reviewing, and accepting or rejecting subcontractor pre-qualification questionnaires.
  - Ensuring that acceptable certificates of insurance, including JVIII as named additional insured, are secured as a condition of subcontract award.
  - Including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations.

- Maintain copies of subcontracts and subcontractor certificates of insurance (including JVIII as named additional insured), bond, contractor's license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel.
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan.
- Manage the site and interface with third parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The HSM responsibilities include the following:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA).
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations.
- Support the SHSO's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site third parties per the HSP.

The SHSO is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:

- Verify this HSP remains current and amended when project activities or conditions change.
- Verify JVIII site personnel and subcontractor personnel read this HSP and sign Attachment 1 "Employee Signoff Form" prior to commencing field activities.
- Verify JVIII site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, CSE) and medical surveillance as identified in Section 3, and maintain the Subcontractor H&S Tracking Form (Attachment 2).
- Verify compliance with the requirements of this HSP and applicable subcontractor HSP(s).
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in this HSP.
- Act as the project "Emergency Coordinator" and perform the responsibilities outlined in this HSP.
- Verify that safety meetings are conducted and documented in the field logbook initially and as needed throughout the course of the project (e.g., as tasks or hazards change).
- Verify that project H&S forms and permits, found in Attachment 3, are being used as intended.

- Verify that Project Activity Self-Assessment Checklists, found in Attachment 4, are being used as intended.
- Implement the Drug-Free Work Place Program (Attachment 5).
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including named additional insured), bond, contractor's license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations.
- Manage the site and interface with third parties in a manner consistent with our contract/ subcontract agreements and the applicable standard of reasonable care.
- Coordinate with the HSM regarding JVIII and subcontractor operational performance, and third-party interfaces.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The training required for the SHSO is as follows:

- Safety Coordinator - Construction (12 hour or equivalent)
- OSHA Construction Safety Awareness (10 hour)
- Safety Coordinator – Hazardous Waste (or equivalent), as necessary by Task Order
- 40 hour HAZWOPER (29 CFR 1910.120/29 CFR 1926.65) as necessary by Task Order
- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.)

The SHSO is responsible for coordinating with the JVIII site supervisor for site operations and the Project Manager. In general, the Project Manager will contact the client, for most matters. The HSM should be contacted by the SHSO as appropriate.

## 2.3 JVIII Subcontractors

Subcontractors that may be covered by this HSP must be provided a copy, or be briefed on the contents, of this HSP prior to initiating work on this site. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., electrical, mechanical). Subcontractors are responsible for the H&S procedures specific to their work, and are required to submit these procedures to JVIII for review before the start of field work. It is critical that subcontractors' work be performed in a manner that is consistent with applicable OSHA standards, EM 385 1-1 or other established HSP(s)/protocols. The JVIII SHSO should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). JVIII oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s), protocols, or established safety regulations.



JVIII should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. JVIII is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SHSO is responsible for confirming JVIII subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Project Activity Self-Assessment Checklists contained in Attachment 4 are to be used by the SHSO to review subcontractor performance.

H&S related communications with JVIII subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1 of this HSP.
- Request subcontractor(s) to brief the project team on the hazards and precautions related to their work.
- When apparent conditions, actions or practices are observed that are not consistent with this HSP, JVIII Health and Safety Program or other H&S protocols, notify the subcontractor safety representative and require corrective action—the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When identified conditions or practices that are not consistent with JVIII H&S policies and procedures or industry standards are repeated or persist, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented. See Stop Work Order (SWO) Form in Attachment 3.0 of this HSP.
- When an apparent imminent danger exists, immediately remove all affected JVIII employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented (see SWO form). Notify the Project Manager and HSM as appropriate.
- Document all oral H&S-related communications in project field logbook, daily reports, or other records.

## 3.0 Project-Specific Hazards

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Exposure to certain project hazards may include injury, accidents, or illnesses from slip/fall, struck by/caught-in-between, noise or chemical exposure, or other identified job site hazards. The intent of this section of the HSP is to facilitate employee awareness in the recognition of potential project-specific and general site hazards that may be associated with the execution of assigned project tasks. All JVIII are required to contact the HSM or designated JVIII safety representatives identified in this HSP for any questions or concerns regarding the safe execution of this task order. The following information is intended to provide procedures and practices to be implemented on the job site that may reduce or eliminate project accidents, injuries, illnesses and property damage that may be associated with identified site hazards.

### 3.1 Adverse Weather

Sudden inclement weather can rapidly encroach upon field personnel. Field crew members performing work outdoors should carry clothing appropriate for bad weather. In severe weather conditions, (i.e., high wind or electrical storms), the field crews should leave the area and find safe shelter until the weather abates and until a decision is made to resume the field activities.

Preparedness and caution are the best defenses against lightning. Many lightning deaths and injuries happen before or after a thunderstorm's peak. The site manager or SHSO shall monitor weather forecasts for predictions of electrical storms in the area. At first sight of lightning, operations shall be stopped and only resumed when conditions permit. The site manager or SHSO shall monitor weather conditions to determine when it is appropriate to resume work. The lightning safety recommendation is 30-30: seek refuge when thunder sounds within 30 seconds after a lightning flash, and do not resume activity until 30 minutes after the last thunder clap. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- Stay away from lakes, streams, pools, or any water.
- Stay away from railroad tracks that can carry lightning charges for long distances.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding. Do not stand on top of a hill.
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or

crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.

- Do not use telephones during electrical storms, except in the case of emergency.

## 3.2 Constituents of Concern

Site COCs are listed in Table 3-1.

TABLE 3-1  
Constituents of Concern  
(Refer to Project Files for more detailed contaminant information)

Constituents	Location and Maximum Concentration (ppm)	Exposure Limit in ppm (PEL)	IDLH PPM	Symptoms and Effects of Exposure	PIP (eV)
Silver (metal)	SS: 1,160 ppb at ISO6SS10	0.01 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	Blue-gray eyes, nasal septum, throat; irritation, ulceration skin; Gastro Intestinal disturbance.	NA

Footnotes:

IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant)

PIP = photoionization potential

NA = Not applicable

SS = surface soil

PEL = Denotes OSHA Permissible Exposure Limit unless otherwise identified.

### 3.2.1 Potential Routes of Exposure

**Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 5.

**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 5 and 6, respectively.

**Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

## 3.3 Radiological Hazards and Controls

Hazards	Controls
None Known	None Required

## 3.4 Clearing and Grubbing-General

Site clearing operations will involve tree felling, brush removal, and vegetation reduction operations. These activities will be executed within a limited area in the southern portion of the remedial area. It is anticipated that land clearing will be executed by both mechanized heavy equipment and ground personnel. When appropriate, trees will be felled by ground crews utilizing chain saws (or brush cutters for small diameter materials). The minimum personal protective equipment (PPE) selection for site clearing operations will be as follows:

- Long trousers, chainsaw chaps, and appropriate footwear (ANSI rated)
- ANSI Z87 approved eyewear with a face shield
- A hardhat with the visor facing forward
- Leather work gloves
- Long-sleeved shirt
- Ear muffs

For safety purposes, substitution of high visibility clothing should be considered where reflective/high visibility vests are normally used.

Trees and other removed vegetation will be consolidated to central processing areas via mechanized heavy equipment outfitted with sufficient material handling attachments. Felled trees and other removed vegetation will be fed into and reduced using a large diameter wood chipper (approximately 12 inches). Feeding of consolidated trees and vegetation will be performed with the mechanized heavy equipment, to the extent possible.

Once clearing operations are substantially completed, grubbing will begin. Where grubbing operations are required, stumps will be removed with mechanized heavy equipment, such as a track excavator. Soil will be removed from the stump root mass to the extent possible and left in place.

The following sections identify general safe work practices associated with land clearing operations.

### 3.4.1 Site Clearing - Tree Felling

The following safe work practices apply to personnel performing tree felling operations.

- Evaluate the tree(s) and the surrounding area for anything that may cause property damage or worker injury when the tree falls.
- Evaluate the shape of tree(s), lean of the tree, and decayed or weak spots.
- Evaluate wind force and direction. Evaluate the location of people and other perceived hazards.
- Evaluate potential electrical hazards. **(Note: no electrical hazards exist in area where tree felling operations are to occur.)**

- Work area shall be routinely cleared to permit safe working conditions. An escape route shall be evaluated by each worker performing tree felling operation.
- Each worker shall be involved in tree felling operations shall be advised on their roles. All workers not directly involved in the operation shall be kept clear of the work area. Create sufficient buffer zone between non-essential ground support personnel and tree felling crew.
- Perform proper maintenance and inspection of all equipment to be utilized in the operation.
- All equipment to be operated and maintained by experienced and qualified operators/personnel.
- De-limb trees from base to top prior to “topping” trees.
- Use directional notching for tree felling (top cut ~60° angle to 20-25% tree diameter and bottom horizontal cut to meet termination point of top cut) before through-cutting of trunks/limbs.
- Tree “topping” operations are to be performed qualified and experienced personnel only.

### 3.4.2 Site Clearing - Chainsaws/Brush Cutters

The following safe work operations apply to personnel using chainsaws/brush cutters.

- Ensure an Activity Hazard Analysis is written for this task.
- Verify that the owner’s manual is available to personnel using equipment.
- Chainsaw operators perform daily or more frequent inspections and maintenance of equipment have inspected equipment. Inspections and maintenance based on chainsaw use as follows:
  - ⇒ No leaks, chain sharpening, oiling mechanism, inspection of chain integrity/tension, chain brake, throttle control, hand guard, chain catcher, carburetor idle, slack adjustment, stop control.
- Do not allow personnel to use chainsaws who do not have appropriate experience or training for the assigned tasks.
- Prohibit smoking while fueling or operating the saw. Refuel the saw only after it has cooled, and require funnel use. Make sure the fuel cap is secured and any fuel spillage is cleaned up. Move sufficient distance away from refueling area before restarting saw. Keep a fire extinguisher nearby. Transport and store fuel only in approved containers.
- Do not distract or disturb someone who is operating a chainsaw.
- Implement proper work break regiments, heat stress monitoring, and fluid intake for personnel operating chainsaws/brush cutters. If they become tired or overheated, ensure they are examined for heat stress – refer to information regarding heat stress monitoring and treatment.

- Working from heights (ladder, aerial lift, back of trucks) requires additional planning and must be approved by the HSM.
- Review Biological Hazard fact sheets contained in Attachment 9 of this document. Use appropriate insect repellents, as applicable.

### 3.4.3 Site Clearing - Chippers

- Mechanical chippers must be maintained in accordance with the manufacturer's specifications.
- The motor ignition shall be locked out and the key removed from the ignition before any maintenance or service is performed, or when the chipper is left unattended.
- The chipper drum shall be blocked, and only authorized persons allowed to perform any service or maintenance.
- On the drum or blades, retightening of chipper blade bolts shall be done according to manufacturer's specifications.
- The chipper shall be equipped with a workable "kill" switch of approved design located at the in feed location.
- The chipper shall have a curtain in place at all times (workable in all weather conditions), in order to prevent fly-back of material.
- Before the wood chipper is started, the apron and feed platform should be checked and cleared of any foreign objects.
- The front of the feed apron table shall be a minimum of 1,500 mm (60 inches) from the chipper blades.
- Hands or feet shall not be placed beyond the curtain guard while the blade is in operation.
- A "push stick" shall be used to force shorter or thorny brush into the chipper.
- Care shall be exercised when chipping dead or frozen wood in order to avoid kickback.
- Maximum diameter of material to be fed into the chipper shall be 150 mm (6 inches), unless manufacturer's specifications allow larger material size.
- Material from 75 mm to 150 mm (3 to 6 inches) diameter shall not exceed 2.5 meters (8 feet) in length, unless manufacturer's specifications allow longer material length.
- The person feeding the chipper shall stand to the side of the apron at the rear of material being fed into the machine.
- No person shall be allowed to stand or sit on any part of the discharge chute while the brush chipper is in operation.
- No person shall stand or sit on any part of the brush chipper while it is in operation or while it is being transported from one job site to another.

- The chipper apron is to be secured in the "up" position when being transported from one job site to another.

### 3.4.4 Machine Guarding

- Ensure that all machine guards are in place to prevent contact with drive lines, belts, chains, pinch points, or any other sources of mechanical injury.
- Unplugging jammed equipment will only be performed when equipment has been shut down, all sources of energy have been isolated, and equipment has been locked/tagged/blocked and tested.
- Maintenance and repair of equipment that results in the removal of guards or would otherwise put anyone at risk requires lockout of that equipment prior to work.

## 3.5 Cranes

(Reserved)

## 3.6 Demolition

(Reserved)

## 3.7 Drilling Safety

(Reserved)

## 3.8 Electrical Safety

Where electrical exposure hazards are possible in the work environment, the following safe work practices must be implemented.

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until hazardous energy control procedures (i.e., lock-out/tag-out) are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
  - Equipped with third-wire grounding.
  - Covered, elevated, or protected from damage when passing through work areas.
  - Protected from pinching if routed through doorways.

- Not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and operating heavy equipment unless the power lines have been verified as being de-energized and grounded or where insulating barriers have been installed to prevent physical contact. To determine proper clearance from energized overhead electric lines, please consult the reference table below.

Nominal System Voltage	Minimum Rated Clearance
0-50 kV	10 ft
51 - 200 kV	15 ft
201 - 300 kV	20 ft
301 – 500 kV	25 ft
501 – 750 kV	35 ft
751 – 1000 kV	45 ft

- Temporary lights will not be suspended by their electric cord unless designed for suspension. Lights will be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

### 3.9 Excavation Activities

For this task order, excavation activities primarily consist of the following operations:

- Grubbing of cleared vegetation within the NTCRA limits to allow for soil removal operations
- Shallow excavation of impacted soil within the defined limits of the NTCRA to approximately 1 ft bgs, and in selected areas, to approximately 4 ft bgs
- Shallow excavation activities to facilitate the installation of a stream/drainage ditch culvert to 2' -3' bgs to reestablish proper site drainage.

During excavation operations, JVIII personnel shall evaluate and implement, as necessary, the following procedures.

- Determine the applicability of 29 CFR 1926, Subpart P, Excavations and EM 385 1-1, Section 25, Excavations.
- Follow all excavation requirements established by the competent person.



Note: A competent person is an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and, who has authority to take prompt corrective measures to eliminate them.

- The competent person must inspect the excavation every day and every day after a hazard increasing event. Documentation of this inspection must be maintained on site at all times.
- JVIII personnel must notify and be granted authorization from the excavation-competent person prior to entering any excavation. JVIII personnel must follow all excavation requirements established by the competent person.
- Each employee in an excavation must be protected from cave-ins by adequate protective systems designed in accordance with applicable OSHA standards (i.e., Design of Sloping and Benching Systems and Design of Support Systems, Shield Systems, and other Protective Systems) except when
  - excavations are made entirely in rock;
  - excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides there is no indication of cave-in.
- Prior to excavating at a location, buried utilities in the area must be identified; refer to “Procedures for Locating Buried Utilities”, included in this HSP.
- JVIII personnel must not enter any excavation where protective systems are deficient at any time, for any reason. The competent person must be notified of such conditions.

PPE and air monitoring requirements shall be executed in accordance with Sections 5.0 and 6.0, respectively, of this HSP in an effort to minimize potential dermal and respiratory exposures to identified site COCs during site excavation operations. In addition, good personal hygiene practices and procedures must be maintained (see Section 7.0 of this HSP)

### 3.10 Fire Prevention

- Be cognizant of and adhere to NSF-IH Fire Prevention Procedures and Requirements.
- Secure a “hot work permit” from the designated NSF-IH Fire Department Official. This task shall be the sole responsibility of the JVIII individual responsible for site activities or SHSO. JVIII individual responsible for site activities or SHSO shall review established NSF-IH hot work procedures and appropriate emergency contact requirements with the designated NSF-IH Fire Department and review this information with all site JVIII and applicable subcontractor personnel.
- Fire extinguishers will be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - Be maintained in a fully charged and operable condition.

- Be visually inspected each month.
  - Undergo a maintenance check each year.
  - The area in front of extinguishers must be kept clear.
- Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire-resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

## 3.11 Flight Line Safety - General

(Reserved)

## 3.12 Hand and Power Tools

- Tools will be inspected prior to use, and damaged tools will be tagged and removed from service.
- Hand tools will be used for their intended use and operated in accordance with manufacturer instructions and design limitations.
- Maintain all hand and power tools in a safe condition.
- Do not set power tools down in muddy or wet areas which may damage the tool and/or create a potential for electric shock.
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool.
- Do not carry or lower a power tool by its cord or hose.
- Portable power tools will be plugged into GFCI-protected outlets
- Portable power tools will be UL listed and have a three-wire grounded plug or be double insulated.
- Disconnect tools from energy sources when they are not in use, before servicing and cleaning them, and when changing accessories (such as blades, bits, and cutters).
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed.
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials.

- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.
- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof, etc.).
- When using a knife or blade tool, stroke or cut away from the body with a smooth motion. Be careful not to use excessive force that could damage the tool, the material being cut or unprotected hands.
- Working with manual and pistol-grip hand tools may involve highly repetitive movement, extended elevation, constrained postures, and/or awkward positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool designs, improved posture, the selection of appropriate materials, changing work organization, and sequencing to prevent muscular, skeletal, repetitive motion, and cumulative trauma stressors.

### 3.13 Haul Trucks

It is anticipated that the use of haul trucks will be limited to the delivery of fill material or transportation and disposal of excavated material that has been identified for off-site disposal/recycling. Where haul trucks are utilized on the project, the following safe work practices shall be considered.

- Haul truck operators should be familiar with their equipment and inspect all equipment before use.
- Haul truck operators should ensure all persons are clear before operating trucks or equipment. Before moving, operators should sound horn or alarm. All equipment should be equipped with an operational backing alarm.
- Haul trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots.
- Employees should stay off haul roads. When approaching a haul area, employees should make eye contact and communicate their intentions directly with the equipment operator.
- Haul roads should be sufficiently wide (at least 50% of the width of the equipment on both sides of road) and equipped with reflectors to indicate access points.

### 3.14 Heavy Equipment

It is anticipated that heavy equipment will be used to facilitate installation of ESC measures, land clearing and grubbing operations, soil removal, handling and loading operations as well as during site restoration activities. When heavy equipment operation on the site is required following procedures will be followed:

- JVIII authorizes only those employees qualified by training or previous experience to operate heavy equipment.

- An Earthmoving Equipment Operator Evaluation Form will be completed and maintained in the project files by the SHSO for all persons who operate heavy equipment (Attachment 3).
- Equipment must be checked at the beginning of each shift to ensure the equipment is in safe operating condition and free of apparent damage. The check should include: service brakes, parking brakes, emergency brakes, tires, horn, back-up alarm, steering mechanism, coupling devices, seat belts and operating controls. All defects will be corrected before the equipment is placed in service.
  - Documentation of this inspection must be maintained on-site at all times (see Equipment Inspection Form in Attachment 3).
- Equipment must be on a stable foundation such as solid ground or cribbing; outriggers are to be fully extended.
- Equipment must not be used to lift personnel; loads must not be lifted over the heads of personnel.
- Equipment, or parts thereof, which are suspended must be substantially blocked or cribbed to prevent shifting before personnel are permitted to work under or between them. All controls will be in a neutral position, with the motors stopped and brakes set.
- Equipment that is operating in reverse must have a reverse signal alarm distinguishable from the surrounding noise or a signal person when the operator's view is obstructed.
- When equipment is used near energized power lines, the closest part of the equipment must be at least 10 ft from power lines < 50 kV. For additional equipment clearances of power transmission lines in excess of 50 kV, please refer to, Electrical Safety information included in this HSP.
- A person must be designated to observe clearances and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. All overhead power lines must be considered to be energized until the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Underground utility lines must be located before excavation begins; refer to the "Procedures for Locating Buried Utilities" included in this HSP.
- Operators loading/unloading from vehicles are responsible for seeing that vehicle drivers are in the vehicle cab or in a safe area.
- The parking brake will be set whenever equipment is parked; wheels must be chocked when parked on inclines.

When not in operation, the blade/bucket/forks/auger, etc., must be blocked or grounded; the master clutch must be disengaged when the operator leaves the cab or is not utilizing equipment controls. When equipment is unattended, power must be shut off, brakes set, blades/buckets/forks landed, and shift lever in neutral.

## 3.15 Ladders and Stairways

(Reserved)

## 3.16 Lock-Out/Tag-Out

(Reserved)

## 3.17 Manual Lifting

- JVIII personnel should notify supervisors or designated safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities, such that the JVIII may evaluate safe operational procedures with regard to the required task.
- Proper lifting techniques (use of knees and not back) must be used when lifting any object:
  - Plan storage and staging to minimize lifting or carrying distances.
  - Split heavy loads into smaller loads.
  - Use mechanical lifting aids whenever possible.
  - Have someone assist with the lift – especially for heavy (>50 lbs.) or awkward loads.  
Note: If JVIII personnel are not capable of lifting 50 lbs. seek assistance from a team member to split the load.
  - Make sure the path of travel is clear prior to the lift.

## 3.18 Noise

Unprotected exposure to excessive noise levels may lead to gradual and permanent hearing loss. The greater the intensity of a noise and the longer a person is exposed to the noise, the greater the chance of hearing loss. A hearing loss can be permanent or temporary. After certain noise exposures, a person may experience a temporary threshold shift (hearing loss) that results in the inability to hear certain sounds. The ability to hear will usually return. However, repeated or intense noise exposure can prevent this recovery, resulting in permanent hearing loss.

Each employee is responsible for the following tasks:

- Notify the SHSO of high-noise-level areas.
- Wear hearing protection when required.
- Complete noise training and audiometric testing (as required).
- Hearing protection is required in work environments exceeding 85 dB.
- Hearing protection will be worn when operating heavy equipment and when working in close proximity to high-noise sources. At a minimum, hearing protection will be worn

when the JVIII personnel are engaged in or in close proximity to the following operations:

- Heavy equipment operation (i.e., land clearing, excavation, soil loading, site restoration)

### 3.19 Pressure Washing Operations

Pressure washing operation may occur prior to final demobilization of materials and equipment from the site. Where pressure washing operations are required, the following safe work practices must be implemented.

- Only trained, authorized personnel may operate the high-pressure washer.
- Rinse waste from pressure washing operations must be collected and properly disposed of.
- Follow manufacturer's safety and operating instructions.
- Inspect pressure washer before use and confirm emergency stop/stop switch is fully operational
- The wand must always be pointed at the work area.
- The trigger should never be tied down
- Never point the wand at yourself or another worker.
- The wand must be at least 42 inches from the trigger to the tip.
- The operator must maintain good footing.
- Non-operators must remain a safe distance from the operator.
- No unauthorized attachment may be made to the unit.
- Do not modify the wand.
- All leaks or malfunctioning equipment must be repaired immediately or the unit taken out-of-service.
- Rain gear (disposal coated chemical suits for Hazwoper operations), 16-inch-high steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves should be worn, at a minimum.

### 3.20 Sample Handling

Sample handling, packaging, and preservation will be conducted in support of field activities to characterize site conditions (soil) or waste materials generated during the execution of the task order. Employee safe work practices and procedures to be followed during these activities include:

- Skin contact with water, soil, sediment or debris of undetermined chemical characterization shall be avoided at all times.

- PPE and Air Monitoring requirements shall be executed in accordance with in accordance with Sections 5.0 and 6.0, respectively, of this HSP to minimize potential dermal and respiratory exposures to identified site contaminants of concern while conducting sample collection or characterization of potentially contaminated media (soil, water, drilling fluids/cuttings, PPE, soil vapor etc.). In addition, good personal hygiene practices and procedures must be maintained (see section 7.0 of this HSP).
- Caution should be exercised when filling bottles containing acid or base preservatives. Both liquid and vapor phases of acid can cause severe burns.
- Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents. Sample activities, sample collection, and equipment decontamination procedures.
- JVIII personnel performing sampling activities shall follow PPE requirements identified by Section 5.0 of this HSP.

### 3.20.1 IDW Drum Handling or Sampling

During the execution of the contract, various types and quantities of Investigation Derived Waste (IDW) will be generated and may include, but not be limited to, PPE and decontamination fluids or residual materials. Personnel are permitted to handle and/or sample drums containing IDW only, as handling or sampling other drums requires a plan revision or amendment approved by the JVIII HSM. The following control measures will be taken when managing drums containing IDW:

- Minimize transportation of drums or other containers with IDW.
- Sample only labeled drums or drums known to contain IDW. Unknown drums or drums that show evidence of excessive buckling/bulging, corrosion, vapors, crystallization, unusual discoloration or other abnormalities may not be sampled without the evaluation of engineering controls, proper PPE, air monitoring equipment and the use properly trained personnel familiar with the sampling of unknown drum contents.
- Use caution when sampling bulging or swollen drums. Relieve pressure slowly and step away from the drum as pressure is being released.
- If drums contain, or potentially contain, flammable materials, use non-sparking (i.e., brass) tools to open the drum.
- Picks, chisels, and firearms may not be used to open drums.
- Reseal bung holes or plugs whenever possible.
- Avoid mixing incompatible drum contents.
- Sample drums without leaning over the drum opening.
- Transfer the content of drums using a method that minimizes contact with material.

- PPE and Air Monitoring requirements shall be executed in accordance with Sections 5.0 and 6.0, respectively, of this HSP in an effort to minimize potential dermal and respiratory exposures to identified site contaminants of concern. In addition, good personal hygiene practices and procedures must be maintained (see section 7.0 of this HSP).
- Spill-containment procedures specified in Section 10 must be appropriate for the material to be handled.

## 3.21 Unknown or Unanticipated Buried Objects

Where unknown or unanticipated buried objects (i.e., drums, tanks, cylinders, munitions of explosive concern) are encountered during site operations, ongoing activities shall be immediately suspended. JVIII or subcontractor personnel encountering unknown or unanticipated buried objects shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area, 3) immediately notify the site manager of the encountered condition and 4) not provide additional disturbance or otherwise handle the buried object. The site supervisor and/or the SHSO shall contact the Project Manager and HSM to evaluate potential hazards associated with the specific situation encountered. The project team will then address the need for the use of special procedures, engineering controls, PPE, or specialized subcontract personnel to safely mitigate the situation.

### 3.21.1 UXO/MEC (Avoidance)

(Reserved)

## 3.22 (Exposure to) Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established:

- Exercise caution when exiting traveled way or parking along street— avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic-related hazards and required controls— sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic – never assume drivers are looking out for you.



- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a “buddy system” should be used, where one worker is looking toward traffic.
- When working on highway projects, obtain a copy of the contractor’s traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices is dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC). All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

In addition to the above safe work practices, JVIII personnel and JVIII subcontractors shall adhere to the following procedures while operating motor vehicles or other motorized equipment on military/government facilities.

- Always using a seat belt while driving on military/government facilities,
- Always observe posted speed limits, traffic signs and signals.
- Never using a cell phone or two way radio while driving on military/government facilities.

Violating these rules may result in loss of military/government facility driving privileges.

## 3.23 Visible Lighting

Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness (including dusk and dawn) requires the set-up of supplemental lighting equipment. (Note: A general “rule of thumb” is that the illumination intensity must be sufficient to read a newspaper without difficulty.) The following chart provides a reference for illumination requirements for various construction related work environments.

<b>Illumination (Foot Candles)</b>	<b>Illumination (Lux)</b>	<b>Area of Operation</b>
5	~ 55	General construction area lighting.
3	~ 33	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	~ 55	Indoors: warehouses, corridors, hallways, and exit ways.
5	~ 55	Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading)
10	~ 108	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls and indoor toilets and workrooms.)
30	~ 323	First aid stations, infirmaries, and offices.

**NOTES:**

- A **footcandle** is a unit of illumination on a surface that is everywhere one foot from a point source of one candle.
- A **lux** is a unit of measurement of the intensity of light. It is equal to the illumination of a surface one meter away from a single candle.

**CONVERSIONS**

- Foot Candles (FC) = Lux x .0929
- LUX = Footcandles x 10.76 - (i.e.: 50 FC = 538 LUX)

The following safe work practices shall be considered with regard to lighting in the work place.

- Do not enter poorly lit areas without first providing portable illumination.
- Do not use non-explosion proof lighting in areas of flammable or combustible gases or liquids.

## 3.24 Working Around Material Handling Equipment

- Never approach operating equipment from the rear. Always make positive contact with the operator, and confirm that the operator has stopped the motion of the equipment.
- Never approach the side of operating equipment; remain outside of the swing and turning radius.
- Maintain distance from pinch points of operating equipment.
- Because heavy equipment may not be equipped with properly functioning reverse signal alarms, never turn your back on any operating equipment.
- Never climb onto operating equipment or operate contractor/subcontractor equipment.
- Never ride contractor/subcontractor equipment unless it is designed to accommodate passengers, equipped with firmly attached passenger seat.
- Never work or walk under a suspended load.

- Never use equipment as a personnel lift; do not ride excavator buckets or crane hooks.
- Always stay alert and maintain a safe distance from operating equipment, especially equipment on cross slopes and unstable terrain.

### 3.24.1 Rigging

Rigging may be employed during the execution of this task order for the unloading of or placement of materials to be incorporated into the project. Where rigging equipment is required on the project, the following safe work practices shall be applicable.

- All rigging equipment must be inspected by a competent person prior to use for signs of excessive wear; equipment found to be damaged will be tagged and removed from service.
- Only one person shall signal the equipment operator during material handling/lifting operations. This person shall be thoroughly familiar with all of the cranes operation and be able to communicate with the crane operator with the appropriate hand signals.
- Suspended loads will not pass over workers at any time. Site personnel are prohibited from passing under suspended loads.
- Rigging use, maintenance and inspection shall be performed in accordance with the applicable standards of 29 CFR 1926.250 and Army Corps of Engineers Manual EM 385 1-1, Section 15, Rigging, whichever is more stringent.
- Only load rated (tagged or labeled) rigging shall be utilized on JVIII projects. User shall familiarize themselves with design load rate capacities (i.e., vertical, basket/cradle or choker applications) for the selected rigging.
- Tag lines shall be attached to every load being lifted.
- Tag lines will be used for all suspended loads so that riggers and tenders will not have to be in direct contact with any suspended load while controlling position or orientation.
- Rigging shall be properly stored in a vertical position, where possible, and inspected daily, by a competent person, before use. An inspection log must be maintained to document inspection proceedings and condition of the rigging. Rigging identified as "damaged" must identified as such and removed from service.

### 3.24.2 Suspended Loads

- Suspended loads will not pass over workers at any time.
- Site personnel are prohibited from passing under suspended loads.
- Tag lines will be used for all suspended loads so that riggers and tenders will not have to be in direct contact with any suspended load while controlling position or orientation.

### 3.24.3 Powered Industrial Trucks

(Reserved)

## 3.25 Working Above or Near Water

(Reserved)

## 3.26 General Hazards

### 3.26.1 General Practices and Housekeeping

- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies will be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and be removed at regular intervals.
- All spills will be quickly cleaned up. Oil and grease will be cleaned from walking and working surfaces.

### 3.26.2 Hazard Communication

The SHSO, or designee, is to perform the following:

- Review of the COC information contained in Table 3-1 (Section 3.5). Additional applicable Hazard Communication information is included in Attachment 8 of this HSP.
- Complete an inventory of chemicals brought on site. See Attachment 8.
- Confirm that an inventory of chemicals brought on site is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which JVIII employees are potentially exposed. Maintain MSDSs in this HSP (Attachment 6).
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 7.

- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

### 3.26.3 Shipping and Transportation of Chemical Products

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

### 3.26.4 Heat Stress

- It is recommended that personnel drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SHSO to avoid progression of heat-related illness.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

### 3.26.5 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress.

The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

### 3.26.6 Cold Stress

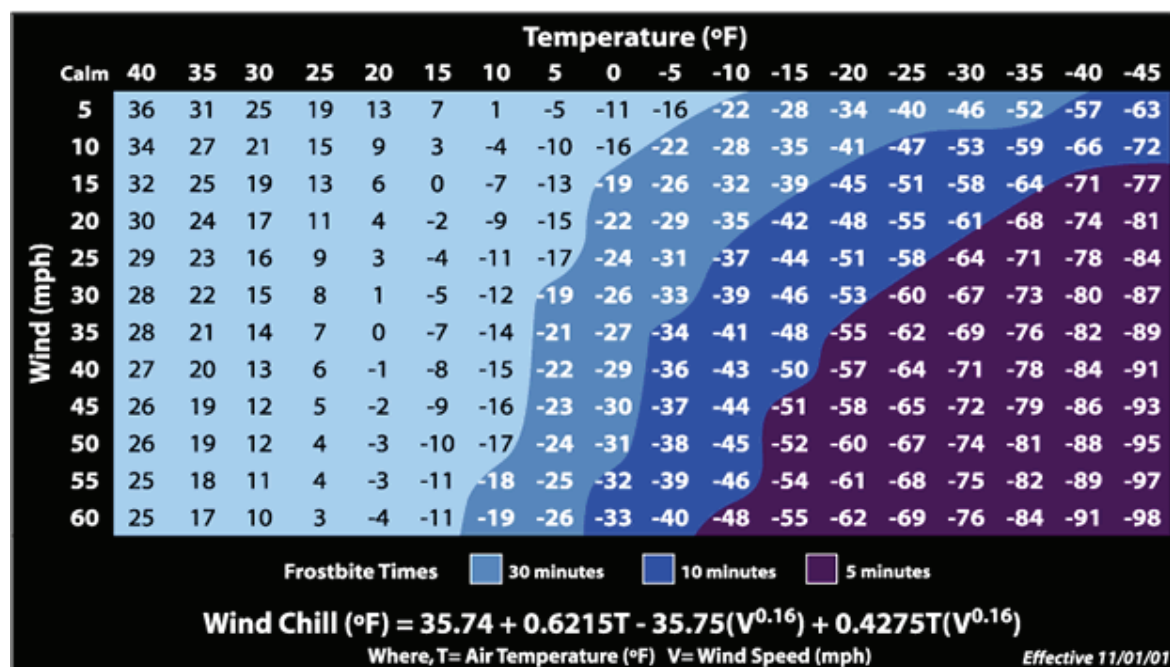
- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-chill index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.

- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SHSO to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but not hot—water. Have victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.



## Wind Chill Chart



## 3.27 Procedures for Locating Buried Utilities

Local Utility Mark-Out Service

Name: Miss Utility of Maryland

Phone: (877) 257-7777

**Email: [www.missutility.net](http://www.missutility.net)**

- Secure the services of a third party utility locate company (specialty subcontractor) to verify local utility mark out services, in areas of congested utility groupings, in areas of government/military facilities where access by local utility mark-out services are in question/inaccessible, or other special situations. When third party utility locate services are secured, the following technologies can be utilized to verify underground utilities:

- Ground Penetrating Radar (GPR),
- Radio Frequency (RF),
- Dual RF,
- Ferromagnetic Detectors
- Electronic markers

A combination of one or more of the above technologies should be used. This survey should be conducted prior to and within 10 days of any ground disturbing activities. The Project Manager or JVIII individual responsible for site operations must ensure that a JVIII representative is on-site to verify/observe the activities of the third party utility locate service.

- A dig permit must be issued prior to any ground-disturbing activities.
- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and sanitary sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval shall be performed manually. Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent construction work is expected to come within 3 feet of the underground utility system. If construction is parallel and within 5 ft (1.5 m) to an existing utility, the utility shall be exposed by hand digging every 30 m (100 feet). Where utilities run parallel to construction for distances of less than 30 m (100 feet), distances will need to be adjusted accordingly to properly verify the location of the utility.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).

When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the JVIII individual responsible for site operations should confirm that arrangement.

## 3.28 Biological Hazards and Controls

Attachment 9 provides a Biological Hazard Fact Sheet. The following sections provide information on potential biological hazards. In addition to safety caution and preventative measures identified in Attachment 9, site personnel should notify their supervisors of any potential allergic reactions that may occur as a result of contact with biological hazards that



in the work place. If employee antidotes are required to counteract allergic reactions from biological hazard exposure, employees shall make personnel providing medical attention aware of the location and type of antidotes needed to counteract any allergic reaction.

### 3.28.1 Snakes

Although the potential exposure to poisonous snakes during the execution of this Task Order is considered to be negligible, this information is included for the purposes of providing employee awareness.

Snakes typically are found in underbrush, tall grassy areas, near cover such as fallen logs, brush piles, rock walls, abandoned foundations, or rock ledges. When traversing in or across such environments, watch where you place your hands and feet as they may be hidden while resting or waiting for prey. Walk around, rather than over, fallen logs. When traveling through areas thought to contain venomous snakes, you can minimize the possibility of an encounter by using common sense. If you encounter a snake do your best to stay calm and look around as there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately.

**DO NOT apply ice, cut the wound, or apply a tourniquet.** Try to identify the type of snake: note color, size, patterns, and markings to assist medical personnel with proper treatment measures (see below – Identification of Poisonous Snakes). There are three identified poisonous snakes that inhabit Maryland. These are the Northern Copperhead, the Timber Rattler and the Eastern Cottonmouth (see below). Note: Rattlesnakes do not always rattle when a “threat” is near.

**Northern Copperhead**

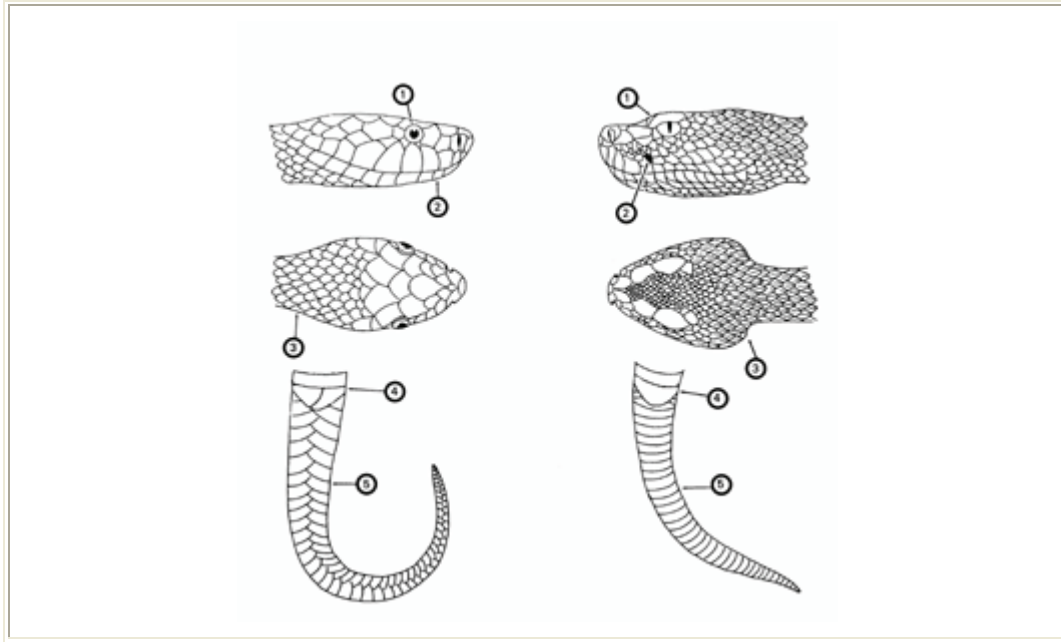


**Timber Rattler (or Canebrake Rattler)**



### Identification of Poisonous Snakes

(Major Identification Features) non-venomous snake	venomous snake
<ol style="list-style-type: none"> <li>1. Round pupils</li> <li>2. No sensing pit</li> <li>3. Head slightly wider than neck</li> <li>4. Divided anal plate</li> <li>5. Double row of scales on the underside of the tail</li> </ol>	<ol style="list-style-type: none"> <li>1. Elliptical pupils</li> <li>2. Sensing pit between eye and nostril</li> <li>3. Head much wider than neck</li> <li>4. Single anal plate</li> <li>5. Single scales on the underside of the tail</li> </ol>



### 3.28.2 Poison Ivy, Oak, and Sumac

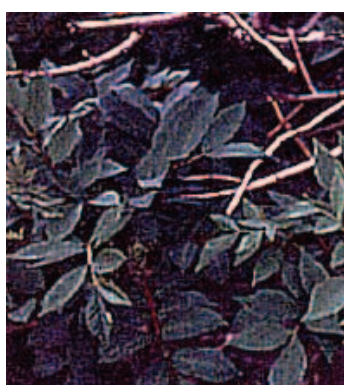
Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Shrubs are usually 12" to 30" high, or can also be a tree-climbing vine, with triple leaflets and short, smooth hair underneath. Plants are red and dark green in Spring and Summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in Fall, but plants lose their (yellowed, then brown) leaves in Winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons.

Become familiar with the identity of these plants (see below). Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention. See attached Biological Fact Sheets in Attachment 9 for additional information.

**Poison Ivy**



**Poison Sumac**



**Poison Oak**



### 3.28.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into/taped to boots; spray **only outside** of clothing with permethrin or permethrin and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention. See attached Biological Fact Sheets

### 3.28.4 Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSO and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

### 3.28.5 Bloodborne Pathogens

(Reference SOP HSE-202, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and PPE are required. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

### 3.28.6 Mosquito Bites

Because of the recent detection of the West Nile Virus in the Southeastern United States, it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET because mosquitoes may bite through thin clothing.

- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

### Symptoms of Exposure to the West Nile Virus

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. The West Nile Virus incubation period is from 3-15 days.

If you have any questions or to report any suspicious symptoms, contact the project HSM.

### 3.28.7 Brown Recluse Spiders

It is regarded by many as the most dangerous spider in the United States. Although sightings of this spider in Maryland are rare, it can occur because of shipping, cars, planes and trains, the Brown Recluse spider can be found most anywhere in the United States. Specific reports of recluse presence have been identified for parts of western Virginia.



Brown Recluse spiders are usually 1 inch or larger in size, including the legs and can grow as large as 3 inches. Young brown recluse spiders are smaller and somewhat lighter in color. Brown recluse spider bites don't always hurt right away. In fact, you may not know that you have been bitten until other symptoms appear. Symptoms of a brown recluse spider bite may include the following:

- Reddened skin followed by a blister that forms at the bite site.
- Mild to intense pain and itching for 2 to 8 hours following the bite.
- An open sore with a breakdown of tissue (necrosis) that develops within a few hours to 3 to 4 days following the bite and the area may become painful, itchy, hot, swollen, red

and tender. An irregular ulcerous sore, caused by necrosis, will often appear that is from 1/4 inch to 10 inches in diameter. Prompt attention is the best defense against preventing the necrosis. The wound is often described as being reddish and surrounded by a bluish area with a narrow whitish separation in between the red and the blue. This gives it the famous "bull's eye" pattern. In just hours, a bite from the highly venomous brown recluse spider can create blisters and cause tissue damage.

Some people have a severe, systemic (whole-body) reaction to brown recluse spider bites, including the rapid destruction of red blood cells and anemia. Signs and symptoms include:

- Fever and chills.
- Skin rash all over the body with many tiny, flat purple and red spots.
- Nausea or vomiting.
- Joint pain.

If you think you have been bitten by a brown recluse spider:

- Remain calm. Too much excitement or movement will increase the flow of venom into the blood.
- Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider.
- Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag to the bite.
- Do not apply a tourniquet. It may cause more harm than benefit.
- Try to positively identify the spider to confirm its type.
- Seek prompt medical attention.

A brown recluse bite can be serious and will likely require immediate medical care. Seek medical attention if you believe you have been bitten by a recluse spider, especially if severe symptoms develop throughout your body or an open sore and necrosis develop. A brown recluse spider bite is diagnosed through a physical examination and questions about the bite. You should be prepared to describe the spider, where and when the bite took place, and what you were doing at the time. Your health professional will ask what your main symptoms are, when they began, and how they have developed, progressed, or changed since the bite.

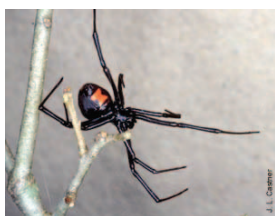
### 3.28.8 Widow Spiders

Females widow spiders range from 8-15 mm in body length; males are smaller, sometimes very small (2 mm). Most have globose, shiny abdomens that are predominantly black with red markings (although some may be pale and/or have lateral stripes), with moderately long, slender legs. These spiders are nocturnal and build a three-dimensional tangled web, often with a conical tent of dense silk in a corner where the spider hides during the day. In

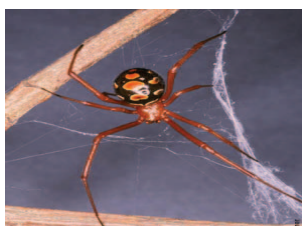


nature, most species are found under rocks and logs, but they readily adapt to human-altered environments, where they are most commonly found in outbuildings, water meter holes, nursery cans, and under any item or structure that has been undisturbed for a lengthy period. Formerly, most bites by black widows (almost all by female spiders) occurred in outhouses, but presently, widow bites occur most frequently when the spider is trapped against human skin, either by reaching under objects where the spider is hiding or when putting on clothing, gloves or shoes containing the spider. Widow spiders are generally very timid and only bite in self-defense when they accidentally contact humans. Although the Northern and Southern black widows are known to inhabit Virginia, others species are depicted below for identification purposes.

#### **Southern Widow**



#### **Red Widow**



#### **Brown Widow**



Note: the northern widow is similar to the southern widow except the telltale red markings are shaped slightly different.

Bite symptoms are systemic, spreading through the lymphatic system, and usually start about 1-3 hours after the bite. The most common symptoms are intense pain, rigid abdominal muscles, muscle cramping, malaise, local sweating, nausea, vomiting, and hypertension. Other symptoms may include tremors, labored breathing, restlessness, increased blood pressure, and fever. If left untreated, widow bite symptoms usually last 3-5 days.

If bitten, remain calm, and immediately seek medical attention (contact your physician, hospital and/or poison control center). Apply an ice pack directly to the bite area to relieve swelling and pain. Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider. A hospital stay may be recommended, particularly for those with a heart condition or with health problems. A physician may administer a specific antivenin to counteract the venom or calcium gluconate to relieve pain. Calcium gluconate and/or antivenin may be administered to relieve or counteract symptoms.

### **3.28.9 Rabid Animals**

Due to the close proximity to the Potomac River there maybe a potential for encounters with a rabid animal, which if bitten can lead to rabies transmission when virus from the animal's saliva, brain tissue, or spinal fluid enters open cuts or wounds in skin or mucous membranes. Not every encounter with a rabid animal may result in a true exposure requiring intervention. Treatment is often provided unnecessarily to people who have encountered but had no true exposure to a potentially rabid animal.

Any penetration of the skin by an animal's teeth is considered a "bite exposure". Local wound care should be performed immediately on anyone bitten by an animal. Local treatment of wounds typically involves immediate and extensive washing of all bite wounds, scratches, or other sites of potential exposure for 10 minutes with soap and water is arguably the most important measure for preventing rabies following an exposure to a rabid animal. Experiments done in animals suggest that thorough and vigorous cleansing to the depth of the wound with a 20% soap solution can reduce the risk of developing rabies. Tetanus booster vaccine (Td) should be given if indicated. A health care provider should be consulted to determine whether or not other measures are necessary. When a bite exposure has been determined laboratory testing of the animal, if available, may be indicated depending upon the circumstances of the exposure (such as whether it was provoked or not) and the species involved. The risks associated bites from different animals varies from place to place. For work on this particular contract, contact with rabid dogs, cats, raccoons and rats could be possible.

"Non-bite exposures" include any scratches, abrasions, or contamination of mucous membranes by an infected animal's saliva, brain tissue, or spinal fluid. Other types of contacts (such as with the blood, urine, feces, or fur of an animal) would not by themselves be considered exposures capable of transmitting rabies even if the animal were known to be rabid. The virus is not hardy; once dry, saliva containing rabies virus is considered non-infectious.

### **3.28.10      Fire Ants**

(Reserved)

## 4.0 Behavior Based Loss Prevention System

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A Behavior Based Loss Prevention System (BBLPS) has been implemented on this project. BBLPS is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic loss prevention tools that will be used to implement the BBLPS on this project include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPO)
- Loss and Near Loss Investigations (NLI)

The JVIII individual responsible for site operations is responsible for implementing the BBLPS on the project site. The JVIII individual responsible for site operations delegates authority to the SHSO for the implementation of the BBLPS on the project site, but the JVIII individual responsible for site operations remains accountable for its implementation. The SHSO will only oversee the subcontractor's implementation of their AHA and PTSP processes on the project.

### 4.1 Activity Hazard Analysis

An AHA defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited before, during and after the performance of work to further identify the hazards posed and control measures required.

An AHA will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 10. The AHA will identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

An AHA will be prepared for all field activities performed by JVIII and subcontractors during the course of the project and should be reviewed and accepted by the HSM. The project-specific, general, and biological hazards discussed in Section 3, the Hazard Analysis Table (Table 1-1), and respective applicable JVIII partner Standards of Practice (SOPs) should be used as a basis for preparing these AHAs.

JVIII subcontractors will be required to provide AHAs specific to their scope of work on the project for acceptance by the SHSO. Each subcontractor will submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific



HSP. Additions or changes in JVIII or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered that require additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

## 4.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/ AHAs that apply for each day's project activities. The PTSPs serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 11, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA(s). The use of PTSPs better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

## 4.3 Loss Prevention Observations

Loss-Prevention Observations (LPOs) will be conducted by the JVIII site supervisor/SHSO for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. LPOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. The JVIII site supervisor/SHSO will perform at least one LPO each week for tasks/operations addressed in the project-specific HSP or AHA. The JVIII site supervisor /SHSO will complete the LPO form in Attachment 12 for the task/operation being observed, following the process below.

## 4.4 Loss/Near-Loss Investigations

Loss/near-loss investigations will be performed for all JVIII and subcontractor incidents involving:

- Person injuries/illnesses and near-miss injuries
- Equipment/property damage
- Spills, leaks, regulatory violations
- Motor vehicle accidents

The causes of loss and near-loss incidents are similar, so by identifying and correcting the causes of near-loss incidents, future loss incidents may be prevented. The following is the loss/near-loss investigation process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where, and how questions.
- Draw conclusions, pitting facts together into a probable scenario.
- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a lesson learned to all project personnel.
- File follow-up on implemented corrective active action to confirm solution is appropriate.

Site Supervisors/SHSO will perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all loss and near-loss incidents that occur on the project. Loss and near-loss incident investigations will be performed using the following incident investigation forms provided in Attachment 13:

- Incident Report Form (IRF)
- Incident Investigation Form
- Root Cause Analysis Form

All loss and near-loss incidents involving personal injury, property damage in excess of \$1,000 or near-loss incidents that could have resulted in serious consequences will be investigated by completing the incident investigation forms and submitting them to the Project Manager and HSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis will be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis will be submitted after completing a comprehensive investigation of the incident.

# 5.0 JVIII Personal Protective Equipment

Personal protective equipment (PPE) specifications are listed in Table 5-1.

Table 5-1 Personal Protective Equipment <sup>a</sup>				
Task	Level	Body	Head	Respirator <sup>b</sup>
Tasks identified in section 1.5 of this HSP.	D	Designated work clothes; Steel/fiberglass-toe work boots (ANSI rated); work gloves (cut resistant).	Hardhat Safety glasses Ear protection (as applicable) <sup>d</sup>	None required
A function, identified in section 1.4 of this HSP, and where dermal contact with COCs is <u>limited to hands only</u> .	Modified D <sub>1</sub>	Designated work clothes; steel/fiberglass-toe work boots (ANSI rated); Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat Safety glasses Ear protection (as applicable) <sup>d</sup> Face shields (in combination with safety glasses or goggles when the potential for exposure to chemical or other splashes hazards may exist).	None required.
A function, identified in section 1.4 of this HSP, and where dermal contact with COCs is potentially <b>NOT</b> limited to the hands and sampling/decommissioning of transformers.	Modified D <sub>2</sub>	<b>Coveralls:</b> Uncoated Tyvek® with high visibility vest or clothing, (coated chemical-resistant coveralls for transformer sampling/decommissioning) <b>Boots:</b> Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner & Outer surgical-style nitrile chemical-resistant nitrile gloves. For sampling of transformers use a 20 mil neoprene gloves.	Hardhat Safety glasses Ear protection (as applicable) <sup>d</sup> Face shields (in combination with safety glasses or goggles while performing the sampling of transformer contents).	None required.
A function, identified in section 1.4 of this HSP and where respiratory and/or dermal exposure to site contaminants of concern will be in excess of established exposure limits as a result of encountered site conditions. Contact HSM prior to implementing Level C PPE upgrade, per Table 6-1.	C	<b>Coveralls:</b> Polycoated Tyvek® <b>Boots:</b> Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat Splash shield <sup>c</sup> Ear protection (as applicable) <sup>d</sup> Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent <sup>e</sup> .
A function, identified in section 1.4 of this HSP and where Level B PPE protection is required to meet established respiratory protection requirements that are in excess of Level C PPE capabilities based on a review of available information. Contact HSM prior to implementing Level B PPE.	B	<b>Coveralls:</b> Polycoated Tyvek® <b>Boots:</b> Safety -toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat Splash shield <sup>c</sup> Ear protection <sup>d</sup> Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA) or Supplied Air Respirator (SAR); MSA Ultralite, or equivalent.
Reasons for Upgrading or Downgrading Level of Protection				
Upgrade <sup>f</sup>		Downgrade		
<ul style="list-style-type: none"><li>Request from individual performing tasks.</li><li>Change in work tasks that will increase contact or potential contact with hazardous materials.</li><li>Occurrence or likely occurrence of gas or vapor emission.</li><li>Known or suspected presence of dermal hazards.</li><li>Instrument action levels exceeded (when implemented).</li></ul>		<ul style="list-style-type: none"><li>New information indicating that situation is less hazardous than originally thought.</li><li>Change in site conditions that decrease the hazard.</li><li>Change in work task that will reduce contact with hazardous materials.</li></ul>		

<sup>a</sup> Modifications are as indicated. JVIII will provide PPE only to JVIII employees.

<sup>b</sup> No facial hair that would interfere with respirator fit is permitted.

<sup>c</sup> Splash-shield areas are to be determined by the SHSO.

<sup>d</sup> Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

<sup>e</sup> Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range --then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.  
**Where JVIII personnel are required to utilize a respirator to provide respiratory protection, JVIII personnel shall receive respiratory protection awareness training. Contact the HSM to receive this training, prior to utilizing any respiratory protective device.**

<sup>f</sup> Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level D modified/Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SHSO qualified at that level is present.

## 6.0 Air Monitoring/Sampling

### 6.1 Air Monitoring Specifications

Air Monitoring Equipment Specifications are listed in Table 6-1.

TABLE 6-1  
Air Monitoring Equipment Specifications

Instrument	Tasks	Action Levels <sup>a</sup>	Level of Protection or Action	Frequency <sup>b</sup>	Calibration
<b>Dust (Aerosol) Monitor:</b> MIE pDR 100 or equivalent	Any activity that generates airborne particulate (dust) that may potentially be above the action level.	No Visible Dust	Level D, Modified D1, or D2 as identified by Table 5-1 for dermal protection	Observe site conditions for signs of visible dust and initiate active air monitoring when sustained visible dust conditions are observed during installation of ESC features, excavation, mechanical separation and loading soil identified for off-site disposal/re-use. Sustained shall be defined as conditions where dust is discharged from the site as a result of active work operations for 5 minutes or longer during any one hour period.	"Zero" instrument at least daily Dust-free area OR Z-bag with HEPA filter
		Visible Dust (initiate air monitoring to verify dust concentrations)	Level D, Modified D1, or D2 as identified by Table 5-1 for dermal protection		
		< 1 mg/m <sup>3</sup>	Level C*		
		> 1 mg/m <sup>3</sup>	<b>* Suspend operations, institute dust control measures (with worker protection from exposure) until readings are below the action level. Contact the HSM before utilizing Level C PPE.</b>		
<b>Personal Sampling</b> Airchek 52 personal sample Pump(s) w/ 0.8 micron mixed cellulose ester filter or equivalent	Any activity identified in section 1.4 of this HSP.	Result < 0.005 mg/m <sup>3</sup> Silver	Level D, Modified D1, or D2 as identified by Table 5-1 for dermal protection	Initially during excavation and material segregation operations and periodically to determine compliance with 29CFR1910 standards.	Manual calibration using rotameter to read 2L/min. Verify calibration prior to sample collection.
		Result > 0.005 mg/m <sup>3</sup> Silver	Level C PPE unless it can be demonstrated and verified that airborne constituents can be controlled to less than the action levels with applied engineering controls.	At a minimum, periodically shall be defined as conditions where active intrusive site operations encroach upon areas within or proximal to "excavation grids" that encompass the following RI sample #s: ISO6SS10. At this time, it is anticipated that the intent of the sampling "frequency" defined by section 6.3 of this HSP shall be met.	

<sup>a</sup> Action levels apply to sustained breathing-zone measurements above background.

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the HSO; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

<sup>c</sup> If the measured percent of O<sub>2</sub> is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O<sub>2</sub> action levels apply only to ambient working atmospheres, and not to CSE. More-stringent percent LEL and O<sub>2</sub> action levels are required for CSE.

<sup>d</sup> Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

<sup>e</sup> Noise monitoring and audiometric testing also required.

## 6.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Air Monitoring equipment calibration specifications are listed in Table 6-2.

TABLE 6-2  
Air Monitoring Equipment Calibration Specifications

Instrument	Gas	Span	Reading	Method
MIE pDR 100 or equivalent	Fresh Air	NA	0.0 mg/M <sup>3</sup>	"Zero" instrument at least daily Dust-free area OR Z-bag with HEPA filter
<b>Personal Sampling</b> Airchek 52 personal sample Pump(s) w/ 0.8 micron mixed cellulose ester filter or equivalent	Fresh Air	NA	2L/min	Manual calibration using rotameter to read 2L/min. Verify calibration prior to sample collection.

## 7.0 Decontamination

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Proper decontamination procedures will be required to ensure negative worker exposure to any identified COCs or hazardous materials. Good personal hygiene practices must be exercised by JVIII personnel to facilitate negative exposure. These practices include but are not limited to the following: 1) Eating, drinking, smoking and tobacco use shall only be conducted in designated areas and not in areas where there is any exposure to hazardous material/waste, flammable/combustible liquids and gases may exist and 2) wash hands and face, if applicable, before eating, drinking, smoking or using tobacco 3) shower as soon as feasible after completing field activities.

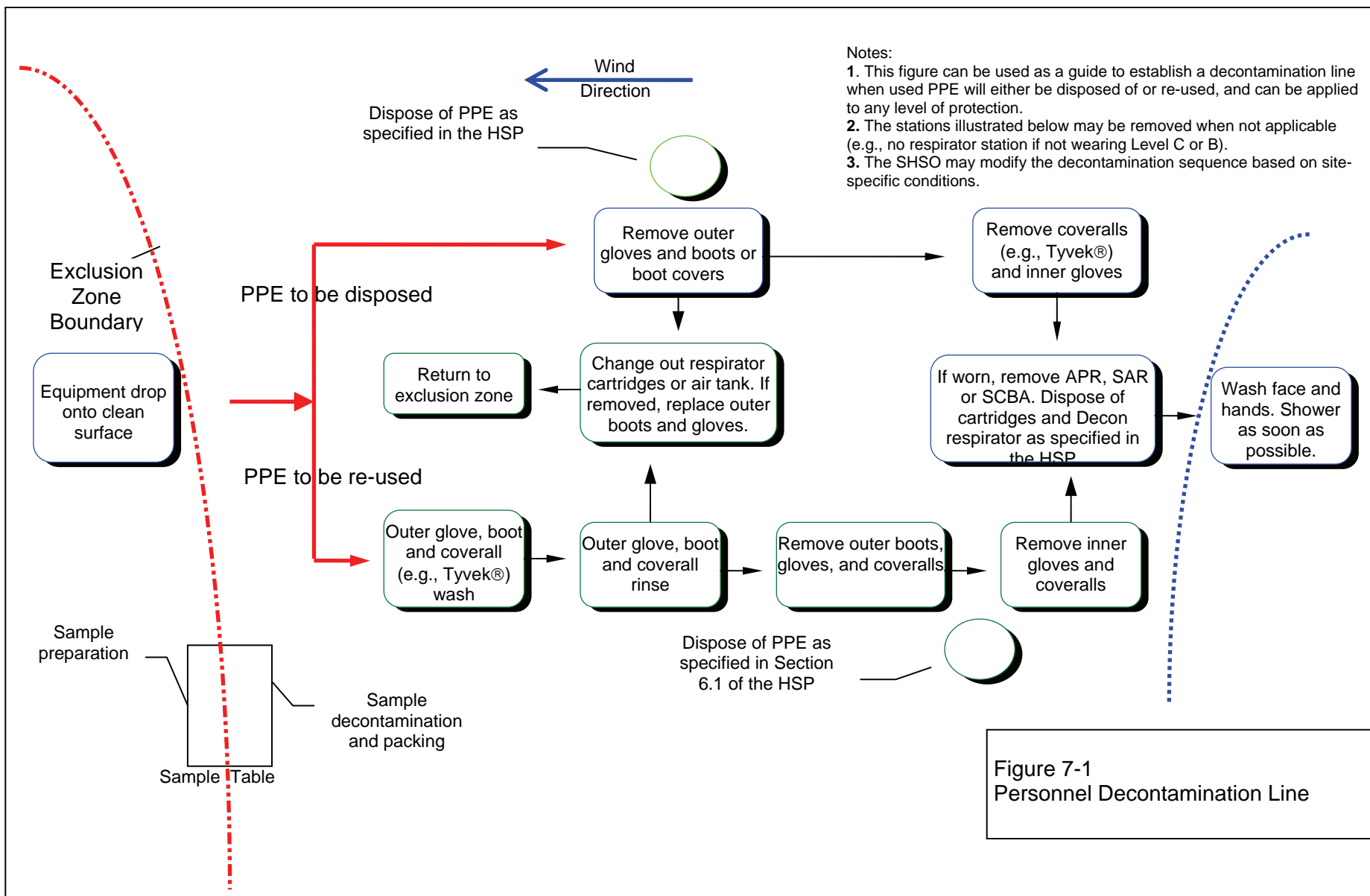
The SHSO must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SHSO. The SHSO must ensure that procedures are established for disposing of materials generated on the site.

### 7.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"><li>• Boot wash/rinse</li><li>• Glove wash/rinse</li><li>• Outer-glove removal</li><li>• Body-suit removal</li><li>• Inner-glove removal</li><li>• Respirator removal</li><li>• Hand wash/rinse</li><li>• Face wash/rinse</li><li>• Shower ASAP</li><li>• Dispose of PPE in municipal trash, or contain for disposal</li><li>• Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>	<ul style="list-style-type: none"><li>• Wash/rinse equipment</li><li>• Solvent-rinse equipment</li><li>• Contain solvent waste for offsite disposal</li></ul>	<ul style="list-style-type: none"><li>• Power wash</li><li>• Steam clean</li><li>• Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>

### 7.2 Diagram of Personnel-Decontamination Procedures

Figure 7-1 is a flow chart of the Personnel Decontamination Line. No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SHSO should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones. In all cases, whether Level D modified or Level C or Level B PPE is required, it is essential for workers to maintain good positive personal hygiene practices.





## 8.0 Spill-Containment Procedures

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Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

### 8.1 Procedure for Containing/Collecting Spills

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large (greater than 55 gallons) and involves a tank or a pipeline rupture, an initial isolation of at least 100 ft in all directions will be used. Small spills (less than or equal to 55 gallons) or leaks from a tank or pipe will require evacuation of at least 50 ft in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), further evacuation will be enforced. In general, an area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled. (Consult the DOT Emergency Response Guide for isolation distances for listed hazardous materials.)

If an incident may threaten the health or safety of the surrounding community, the public will be informed and possibly evacuated from the area. The on-site emergency coordinator will inform the proper agencies in the event this is necessary. An Emergency Contact List is provided in Attachment 14.

As called for in regulations developed under the comprehensive Environmental Response Compensation Liability Act of 1980 (Superfund), JVIII's practice is to report a spill of a pound or more of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA. TMS also follows the same practice for any substances not listed in the Acts noted above but which can be classified as a hazardous waste under Resource Conservation and Recovery Act (RCRA).

Cleanup personnel take the following measures:

- Review product specific MSDSs (Attachment 6) to determine the appropriate neutralization process for spilled materials.
- Ensure all unnecessary persons are removed from the hazard area.

- Put on protective clothing and equipment.
- If a flammable material is involved, remove all ignition sources, and use spark- and explosion-proof equipment for recovery of material.
- Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
- If wastes reach a sanitary sewer, dam the outfall by using sand, earth, sandbags, etc. Pump this material out into a temporary holding tank or drums as soon as possible.
- Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.
- Spray the spill area with foam, if available, if volatile emissions may occur.
- Apply appropriate spill control media (e.g. clay, sand, lime, etc.) to absorb discharged liquids.
- For large spills, establish diking around leading edge of spill using booms, sand, clay or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank.

# 9.0 Site-Control Plan

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## 9.1 Site-Control Procedures - General

(Reference SOP HS-11, *Site Control*)

- Project managers are to:
  - 1) Evaluate and ensure worker safety in remote/secluded work areas,
  - 2) Confirm if potentially dangerous activities (i.e., coincidence of hunting seasons, live ordinance use, military field exercises/activities, transfer of dangerous or explosive cargo/materials, location of explosive arc zones etc.) could be occurring in or adjacent to any JVIII work areas that may jeopardize worker health and safety and
  - 3) Reschedule field activities when potentially dangerous activities are not occurring adjacent to JVIII work locations. Ensure proper two communications with workers in remote work areas. Utilize buddy system. The SHSO, or designee, will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of HSP, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SHSO records attendance at safety briefings in a logbook and documents the topics discussed.
- Ensure that applicable JVIII personnel have received the BBLPS training
- Execute CSE procedures as may be required for site operations.
- Understand if there is a potential of being exposed to hazardous chemicals. If yes, what precautions/training are required?
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Know how an emergency should be reported.
- Identify exact facility location and position (where possible) when contacting EMS/Fire Dispatch.
- Have readily available copy of the Hospital Route Map.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn

- Two-way radio or cellular telephone if available
- Designate an emergency evacuation route.
- Designate an evacuation assembly area.
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Know how, what, when injuries/accidents are reported and treated.
- Initial air monitoring is conducted by the SHSO in appropriate level of protection.
- The SHSO is to conduct periodic inspections of work practices to determine the effectiveness of this plan – refer to Sections 2 and 3. Deficiencies are to be noted, reported to the HSM, and corrected.

## 9.2 Specific Site Control Measures

To prevent both exposure of unprotected personnel and migration of contamination, work areas and personal protective equipment requirements will be clearly identified. EWT designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," (i.e. NIOSH/OSHA/USCG/EPA). This document recommends that the area surrounding each of the work areas be divided into three (3) zones; the exclusion zone (EZ), the contamination reduction zone (CRZ), and the support zone. At the time of writing the traffic control plan has not been approved.

Suitable means and methods (high visibility fencing, caution tape signage, other physical barriers) shall be employed to demarcate the boundaries at this site to prevent unauthorized entry into the EZ zone. Only individuals who meet the requirements of 29 CFR 1910.120 and who are authorized by the JVIII individual responsible for site operations or the SHSO shall be allowed entry into the EZ. A CRZ for decontamination shall be established adjacent to the EZ, as illustrated in Figure 1. The support zone shall be kept free from contamination.

Contaminated personnel and equipment will exit the EZ directly to the CRZ. A typical CRZ is also illustrated in Section 7.0 Decontamination, Figure 7-1. Each CRZ will contain a decontamination zone for personnel and an equipment decontamination pad. If possible, the CRZ will be located upwind of each EZ, however due to site constraints this may not be possible. Temporary support zones for each work area will be located adjacent to the CRZs. The EZs and CRZs will be established using jersey barriers and caution tape or other suitable methods.

### 9.2.1 Exclusion Zone

An EZ will be constructed surrounding each excavation and will be moved as the excavation progresses. Because of space limitations, the exclusion zone fencing may be the "permanent" perimeter fencing. Note that the term "permanent" is often used to describe the outer limits (or perimeter) of a work site; the "permanent" fence in this project will be relocated as the project progresses. Jersey barriers and red caution tape will be used to outline the EZ to identify the restricted area. Access to the EZ will be restricted to personnel

wearing the prescribed level of protective equipment and meeting the minimum training and medical criteria of this plan. If necessary, a flag person will be designated for traffic control.

### 9.2.2 Contamination Reduction Zone

Each CRZ zone will be a clearly marked corridor between the exclusion and support zones. The CRZ for each area will be located immediately adjacent to the EZ and will be identified with yellow caution tape as illustrated in Figure 1. This area will be identified with yellow tape and will include the equipment and personnel decontamination stations.

The CRZ is where personnel will begin the sequential decontamination process when exiting the exclusion zone. To prevent cross contamination and for accountability purposes, all personnel must enter and leave the exclusion zone through the CRZ.

### 9.2.3 Support Zone

Temporary support zones and staging areas will be established at the entrance of each control area. Potable water, an eye wash, and first aid supplies will be located at each temporary support zone. No hazardous or potentially hazardous materials will be allowed in the support zone unless it is in a properly labeled container that has no external contamination. Eating, drinking and smoking will be allowed only in this area.

Portable bathroom facilities (and shower facilities/trailer where Level B is utilized) will be located near the work areas. In addition, potable water and water and soap for hand washing will be available at each temporary support zone, along with containers for solid waste for use by site personnel.

## 9.3 HAZWOPER Compliance Plan

(Reference SOP HS-19, *Site-Specific Written Safety Plans*)

Certain parts of the site work are covered by state or federal HAZWOPER standards and therefore require training and medical monitoring. Anticipated HAZWOPER tasks (Section 1.4 or otherwise determined) might occur consecutively or concurrently with respect to non-HAZWOPER tasks. This section outlines procedures to be followed when approved activities specified in Section 1.5 do not require 24- or 40-hour training. Non-HAZWOPER-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-HAZWOPER-trained personnel are allowed on the site, or while non-HAZWOPER-trained staff are working in proximity to HAZWOPER activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to Sections 3 and 6 of this HSP for contaminant data and air sampling requirements, respectively.
- When non-HAZWOPER-trained personnel are at risk of exposure, the SHSO must post the exclusion zone and inform non-HAZWOPER-trained personnel of the:

- Nature of the existing contamination and its locations
  - Limitations of their access
  - Emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminated media.
- When exposure is possible, non-HAZWOPER-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to H&S hazards.

# 10.0 Emergency Response Plan

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(Reference SOP HS-12, *Emergency Response*)

## 10.1 Pre-Emergency Planning - General

The SHSO performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with JVIII on-site parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what on-site communication equipment is available (e.g., two-way radio, air horn).
- Determine what off-site communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to on-site personnel.
- Review changed site conditions, on-site operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.

The SHSO will evaluate emergency response actions and initiate appropriate follow-up actions.

## 10.2 Emergency Equipment and Supplies

The SHSO should mark the locations of emergency equipment on the site map and post the map. Equipment and locations are listed below.

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle
Additional equipment (specify): Mobile phone, 2.5 lb fire extinguisher (A, B, and C classes)	Support Zone/Field Vehicle

## 10.3 Incident Reporting, Investigation and Response

The SHSO is responsible for implementing the Accident Prevention Plan (Attachment 15). For any accident meeting the definition of **Recordable Occupational Injuries or Illnesses or Significant Accidents**, the NAVFAC Contracting Officer and Navy Technical Representative (NTR) will be notified by the HSM or Project Manager soon as practical, **but not later than four hours after occurrence**. All other incidents must be reported to NAVFAC within 24 hours of incident occurrence. Only authorized JVIII personnel (JVIII Program Manager and/or Deputy Program Manager) may make notification to NAVFAC regarding project accidents, injuries or illnesses.

Therefore, in order for the incident to be assessed for reportability purposes, it is imperative that according to JVIII requirements, **all personal injuries, near misses, or property damage incidents involving JVIII or subcontractor project personnel be reported IMMEDIATELY to the chain of command personnel identified in Section 10.7 and Attachment 14.0 of this HSP.**

- Date and time of incident
- Project name and project number
- Name and worker classification
- Extent of known injuries
- Level of medical attention
- Injury cause

A written incident investigation will be performed and submitted to the HSM within 24 hours of incident occurrence by the completing the Incident Report, Near-Loss Investigation and Root Cause Analysis provided in the HSP Attachments.

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down JVIII operations and evacuate the immediate work area.
- Notify appropriate response personnel.
- Account for personnel at the designated assembly area(s).



- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

## 10.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. JVIII employee injuries and illnesses must be reported to the Human Resources contact in Attachment 14. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the JVIII medical consultant, depending on whose employee is injured. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities (e.g., 911).
- The SHSO will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 10.3.

A map showing the route to the hospital is shown on Figure 10-4.

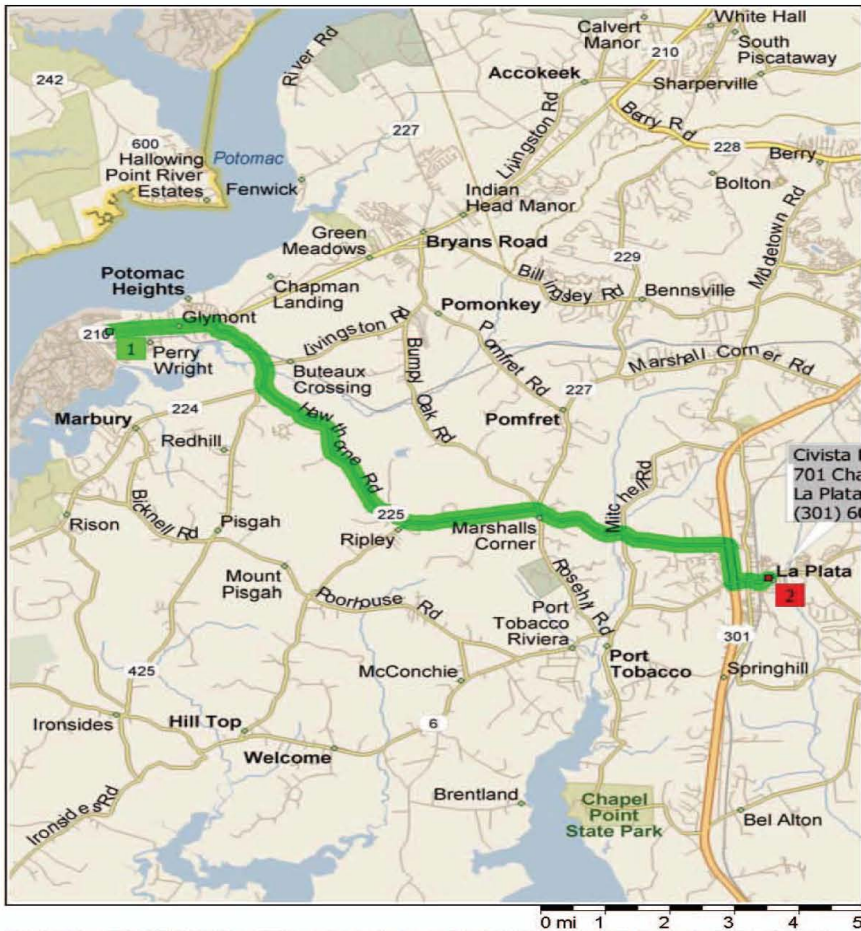
## 10.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the SHSO before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SHSO and a “buddy” will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.

- The SHSO will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The SHSO will write up the incident report as soon as possible after it occurs and submit a report to the Corporate HSM.
- A Hurricane Preparedness Plan is not included in this plan as it is anticipated that the work will be executed after November 30, 2007 but before May 15, 2008.

## Indian Head to Civista Medical Center

13.5 miles; 21 minutes



9:00 AM	0.0 mi	<b>1</b> Depart Indian Head on SR-210 [Indian Head Hwy] (East) for 1.6 mi
9:02 AM	1.6 mi	Turn RIGHT (South) onto SR-225 [Hawthorne Rd] for 1.2 mi
9:04 AM	2.8 mi	Bear RIGHT (South) onto SR-224 [SR-225] for 0.4 mi
9:05 AM	3.2 mi	Bear LEFT (South-East) onto SR-225 [Hawthorne Rd] for 8.6 mi
9:17 AM	11.8 mi	Keep STRAIGHT onto SR-225 [W Hawthorne Rd] for 0.4 mi
9:18 AM	12.2 mi	Turn RIGHT (South) onto US-301 [Blue Star Memorial Hwy] for 0.7 mi
9:19 AM	12.9 mi	Turn LEFT (East) onto SR-6 for 21 yds
9:20 AM	12.9 mi	Keep STRAIGHT onto SR-6 [E Charles St] for 0.6 mi
9:21 AM	13.5 mi	<b>2</b> Arrive Civista Medical Center

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 Portions © 1990–2006 InstallShield Software Corporation. All rights reserved. Certain mapping and direction data © 2005 NAVTEQ. All rights reserved. The Data for areas of Canada includes information taken with permission from Canadian authorities, including: © Her Majesty the Queen in Right of Canada, © Queen's Printer for Ontario. NAVTEQ and NAVTEQ ON BOARD are trademarks of NAVTEQ. © 2005 Tele Atlas North America, Inc. All rights reserved. Tele Atlas and Tele Atlas North America are trademarks of Tele Atlas, Inc.

Civista Medical Hospital, 701 Charles Drive, La Plata, MD 20646 (301) 609-4000

## 10.6 Evacuation Signals

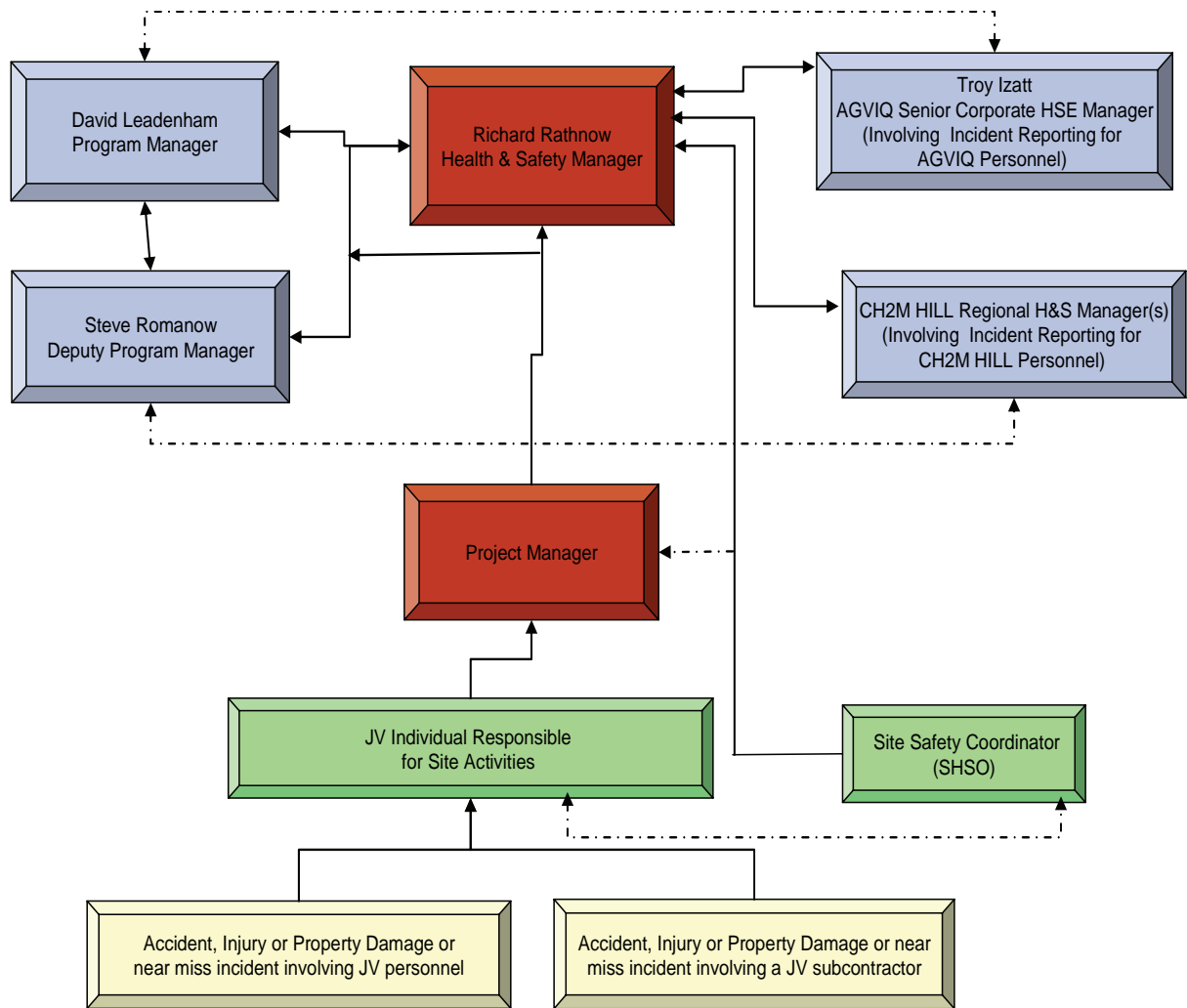
Evacuation signals are listed below.

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

## 10.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, accident, injury/illness, near miss, property damage, death, etc.), immediately notify the Project Manager and HSM. Figure 10-7 below identifies the JVIII Incident Reporting Process.
- For JVIII work-related injuries or illnesses, contact the respective resources on the emergency contact list in Attachment 14.0 of this HSP. For JVIII incidents the SHSO administrator completes an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For JVIII subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to the HSM.
- Notify and submit reports to client as required in contract.

**Figure 10-7**  
**JV I INCIDENT REPORTING PROCESS**



## 11.0 Approval

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This site-specific HSP has been written for use by JVIII only. JVIII claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

### 11.1 Original Plan

**Prepared By: Stephen J. Matney**

**Date: 09-19-07**



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**Reviewed By: Glen Jackson**

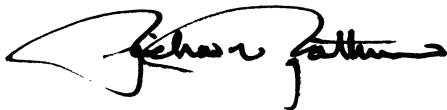
**Date: 9-28-07**



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**Approved By: Rich Rathnow**

**Date: 3-17-2008**



### 11.2 Revisions

**Revisions Made By:**

**Date:**

---

**Revisions to Plan:**

---

**Revisions Approved By:**

**Date:**

## 12.0 Site Specific Maps/Figures

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Figure 1-1: Facility Location Map (see work plan)

Figure 1-2: Proposed Excavation Area – Site 6 (see work plan)

## Attachment 1

### Employee Signoff Form



## Health and Safety Plan

**Project Name:** NSF-IH Site 6 (Fenced Area) Removal **Task Order:** 005

[illegible]

## Attachment 2

### Subcontractor H&S Tracking Form

Subcontractor H&S Tracking Form
---------------------------------

<b>Project Name:</b>	<b>Task Number:</b>	<b>Date:</b>
----------------------	---------------------	--------------

<b>Project Name:</b>	<b>Task Number:</b>	<b>Date:</b>
----------------------	---------------------	--------------

<b>Project Name:</b>	<b>Task Number:</b>	<b>Date:</b>
----------------------	---------------------	--------------

[illegible]

- |     |  |
|-----|--|
| 22. | Hazard Specific Training may include: Hazcom, asbestos, lead, fall protection, electrical, lock-out tag-out, drilling, demolition, etc.    |
| 23. | Equipment Specific Training may include: Industrial (fork) truck, aerial lift, crane, portable extinguisher, respirator, scaffolding, etc. |
| 24. | Medical Clearance documents must <b>not</b> include actual medical reports. Only accept a signed physician's statement of fitness to work. |

## Attachment 3

### Project H&S Forms/Permits

## EQUIPMENT INSPECTION FORM

This form will be used to document JVIII's earthmoving equipment inspections. Earthmoving equipment will be inspected each day and shift prior to use. All components will be inspected for damage and proper operation. Any component failing the inspection will be corrected prior to earthmoving equipment use. Check each box after passing inspection and initial bottom of form each day.

Equipment Name: \_\_\_\_\_ Identification #: \_\_\_\_\_ Week of: \_\_\_\_\_

INSPECTION ITEM	Mon	Tue	Wed	Thu	Fri	Sa	Sun
<b>Visual Checks</b>							
Operating manual – present							
Controls - labeled as to their function, visible and legible, safety latches/guards present							
Tires/tracks – proper inflation/tension, not excessively worn or damaged							
Fluid levels/leaks - engine, transmission, hydraulic, radiator, swing motor and PTO oils.							
Lubrication - to the manufacturer's specifications							
Air filter gauge - gauge is not in the red zone.							
Hydraulics – no fluid leaks, connections tight, hoses, cylinders free of damage.							
Hoses/belts – held securely, not loose or rubbing, no excessive wear or crimping							
Fuel system - tank free of damage, all valves/hoses secure, no leaks							
Body & ground-engaging tools – no damage, cracks, bends, or excessive wear.							
Cylinders/articulation joints– no worn pins, loose connections or other damage.							
Roll-over protective structures (ROPS) - no damage, no cracks or bends							
Seat belt/bar – required unless operator stands or no ROPS							
Handrails, steps, platforms – clean, free from grease, oil, clear of obstructions.							
Cab glass – safety glass, clean, no cracks or visible distortion							
Mirrors – properly adjusted, no cracks or visible distortion							
Windshield wipers, fluid, and defroster - functioning							
Machine guards – present and in good condition							
1. Fire extinguisher – present and charged							
<b>Operational Checks – check items through normal maneuvers</b>							
Horn & back-up alarm – operating and distinguishable from surrounding noise							
Lights, directional signals, and brake lights - functioning							
Gauges/indicators – visible and working properly							
Operating controls - lift and tilt functioning properly							
Outriggers, if present – functioning properly							
Accelerator - even acceleration, does not stick							
Brakes (service & parking) - brings to complete stop, holds in fixed position							
Steering – responsive, minimal looseness							
Exhaust system – guarded if potential for contact, no signs of sparks/leaks							
<b>Inspector's Initials</b>							

# EQUIPMENT OPERATOR EVALUATION FORM

Page 1 of 2

JVIII employees who are required to operate earthmoving equipment will be evaluated and approved as qualified earthmoving equipment operators by an authorized JVIII Earthmoving Equipment Operator Evaluation Designated Persons (DP).

This form will be used by the DP to assess, approve, and document the qualifications of JV 1 employees who are required to operate earthmoving equipment.

Employee (Operator) Name: \_\_\_\_\_ JV 1 employee #: \_\_\_\_\_

JVIII Company: \_\_\_\_\_ Business Group: \_\_\_\_\_ Region: \_\_\_\_\_

Type of equipment to be operated: \_\_\_\_\_

## 1. Background Review

Resume and other documentation (training certificates) will be reviewed and verified with previous employers. The individual will also possess a valid driver's license. This review should take place prior to hiring.

☐ Background Review found to be adequate. Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ DP initials: \_\_\_\_\_

## 2. Classroom Evaluation

- a. Employee will read and understand the manufacturer's Equipment Operation Manual for the specific piece of equipment to be operated.
- b. Employee will read and understand the CH2M HILL *Earthmoving Equipment* (HSE-306) and *Excavations* (HSE-307) Standards of Practice.
- c. DP will discuss safe operating practices with the employee.
- d. Employee will pass JVIII's written earthmoving equipment operator exam. (See Attachment 4 for exam guidelines)

☐ Classroom Evaluation successfully completed. Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ DP initials: \_\_\_\_\_

## 3. Field Evaluation

### a. Equipment Awareness, Inspection and Maintenance

The DP will observe the employee perform a daily inspection using the Earthmoving Equipment Inspection Form. The employee will demonstrate the ability to recognize deficient conditions that could affect the safe operation of the equipment. In addition, the operator will demonstrate awareness of the following:

- ☐ Location of vital fluid reservoirs
- ☐ Location of all lubrication points
- ☐ Proper fueling procedures
- ☐ Location and function of safety disabling devices (if equipped)
- ☐ Location and function of safety devices (fire extinguisher, back-up alarm, seat belt/bar, guards)
- ☐ Location of manufacturer warning labels, weight of equipment, and lift capacities labels
- ☐ Location and function of all gauges, indicators and controls (horn, lights, mirrors, etc.)
- ☐ Acceptable conditions for passing items during daily inspections
- ☐ Periodic maintenance requirements

## EQUIPMENT OPERATOR EVALUATION FORM

Page 2 of 2

### b. Equipment Operation

The DP will observe the employee operating the equipment through normal maneuvers. The employee will demonstrate the ability to operate the equipment safely and in accordance with the manufacturer's guidelines.

- ☐ Demonstrates ability to safely start equipment in preparation for use (proper start-up sequence followed)
  - ☐ Understands function and proper appearance of all gauges and indicators
  - ☐ Understands location and use of all equipment controls
  - ☐ Checks front, side, and rear of equipment for pedestrians, traffic and obstructions
  - ☐ Demonstrates smooth and safe equipment travel
  - ☐ Demonstrates smooth and safe control operations
  - ☐ Demonstrates safe loading and binding of equipment for travel
  - ☐ Demonstrates normal shut-down procedures
  - ☐ Demonstrates emergency shut-down procedures
  - ☐ Demonstrates safe parking and storage of equipment
- ☐ Field Evaluation successfully completed. Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ DP initials: \_\_\_\_

### Operator Acknowledgement

I have reviewed and understand all of the information listed above. I also understand that as an operator of this equipment, I am responsible for daily inspections and maintenance as well as the safe and efficient operation of the equipment listed above.

\_\_\_\_\_  
Operator Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

### Qualification approval

The employee has completed the earthmoving equipment operator evaluation process and is qualified to operate the type of earthmoving equipment identified above.

\_\_\_\_\_  
DP Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
HS&E Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

A copy of this evaluation form will be maintained in the project file and the original sent to the HS&E department for retention.



# Stop Work Order Form

REPORT PREPARED BY:

Name:	Title:	Signature:	Date:

---

## ISSUE OF NONPERFORMANCE

<b>Description:</b> _____ _____ _____ _____ _____ _____	<b>Date of Nonperformance:</b> _____  
--	---

## SUBCONTRACTOR SIGNATURE OF NOTIFICATION:

Name:	Title:	Signature:	Date:

---

*\* Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.\**

## SUBCONTRACTOR'S CORRECTIVE ACTION

<b>Description:</b> _____ _____ _____ _____ _____ _____	<b>Date of Corrective Actions:</b> _____  
--	---

## SUBCONTRACTOR SIGNATURE OF CORRECTION:

Name:	Title:	Signature:	Date:



## Attachment 4

### Project Activity Self-Assessment Checklists

## H&S Self-Assessment Checklist – HAND AND POWER TOOLS

This checklist shall be used by AGVIQ-CH2MHILL JOINT VENTURE III ( JVIII) personnel **only** and shall be completed at the frequency specified in the project's HSP.

This checklist is to be used at locations where: 1) JVIII employees are exposed to hand and power tool hazards and/or 2) JVIII provides oversight of subcontractor personnel who are exposed to hand and power tool hazards.

The Safety Coordinator (SC) may consult with subcontractors when completing this checklist, but shall not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_

Location: \_\_\_\_\_ PM: \_\_\_\_\_

Auditor: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

This specific checklist has been completed to:

- ☐ Evaluate JVIII employee exposure to hand and power tool hazards.  
☐ Evaluate a JVIII subcontractor's compliance with hand and power tool requirements.

Subcontractors Name: \_\_\_\_\_

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-50.

### SECTION 1

Yes No N/A N/O

#### **SAFE WORK PRACTICES (3.1)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. All tools operated according to manufacturer's instructions and design limitations.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. All hand and power tools maintained in a safe condition and inspected and tested before use.       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Defective tools are tagged and removed from service until repaired.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. PPE is selected and used according to tool-specific hazards anticipated.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Power tools are not carried or lowered by their cord or hose.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Safety guards remain installed or are promptly replaced after repair.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Tools are stored properly.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Cordless tools and recharging units both conform to electrical standards and specifications.       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Tools used in explosive environments are rated for such use.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Knife or blade hand tools are used with the proper precautions.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## H&S Self-Assessment Checklist – HAND AND POWER TOOLS

<u>SECTION 2</u>		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<b>GENERAL (3.2.1)</b>					
13. PPE is selected and used according to tool-specific hazards anticipated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14. Tools are tested daily to assure safety devices are operating properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15. Damaged tools are removed from service until repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16. Power operated tools designed to accommodate guards have guards installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17. Rotating or moving parts on tools are properly guarded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18. Machines designed for fixed locations are secured or anchored.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19. Floor and bench-mounted grinders are provided with properly positioned work rests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20. Guards are provided at point of operation, nip points, rotating parts, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ELECTRIC-POWERED TOOLS (3.2.2)</b>					
22. Electric tools are approved double insulated or grounded and used according to SOP HS-23.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23. Electric cords are not used for hoisting or lowering tools.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
26. Portable, power-driven circular saws are equipped with proper guards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ABRASIVE WHEEL TOOLS (3.2.3)</b>					
27. All employees using abrasive wheel tools are wearing eye protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28. All grinding machines are supplied with sufficient power to maintain spindle speed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
29. Abrasive wheels are closely inspected and ring-tested before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
30. Grinding wheels are properly installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
31. Cup-type wheels for external grinding are protected by the proper guard or flanges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
32. Portable abrasive wheels used for internal grinding are protected by safety flanges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
33. Safety flanges are used only with wheels designed to fit the flanges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PNEUMATIC-POWERED TOOLS (3.2.4)</b>					
35. Tools are secured to hoses or whip by positive means to prevent disconnection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
36. Safety clips or retainers are installed to prevent attachments being expelled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Safety devices are installed on automatic fastener feed tools as required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	37.
38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40. Hoses are not used for hoisting or lowering tools.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
42. Airless spray guns have required safety devices installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
44. Supports are provided for mounting nozzles when not in use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
45. Air receiver drains, handholes, and manholes are easily accessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
47. Air receivers are completely drained at required intervals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
48. Air receivers are equipped with indicating pressure gauges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
49. Safety, indicating, and controlling devices are installed as required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
50. Safety valves are tested frequently and at regular intervals to assure good operating condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## **SECTION 2 (continued)**

**Yes No N/A N/O**

### **LIQUID FUEL-POWERED TOOLS (3.2.5)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuels are stored, handled, and transported in accordance with SOP HS-21                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### **POWDER-ACTUATED TOOLS (3.2.6)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 55. Only trained employee operates powder-actuated tools.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Powder-actuated tools are not loaded until just prior to intended firing time.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Tools are not pointed at any employee at any time.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. Hands are kept clear of open barrel end.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Loaded tools are not left unattended.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 60. Fasteners are not driven into very hard or brittle materials.                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Fasteners are not driven into spalled areas.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Powder-actuated tools are not used in an explosive or flammable atmosphere.                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 64. All tools are used with correct shields, guards, or attachments recommended by manufacturer.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### **JACKING TOOLS (3.2.7)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 65. Rated capacities are legibly marked on jacks and not exceeded.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Jacks have a positive stop to prevent over-travel.                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. The base of jacks are blocked or cribbed to provide a firm foundation, when required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Wood blocks are placed between the cap and load to prevent slippage, when required.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 69. After load is raised, it is cribbed, blocked, or otherwise secured immediately.       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 71. All jacks are properly lubricated.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 72. Jacks are inspected as required.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 73. Repair or replacement parts are examined for possible defects.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 74. Jacks not working properly are removed from service and repaired or replaced.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### **HAND TOOLS (3.2.8)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 75. Wrenches are not used when jaws are sprung to the point of slippage.                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 76. Impact tools are kept free of mushroomed heads.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## H&S Self-Assessment Checklist – HAND AND POWER TOOLS

### SECTION 3

Complete this section for all items checked “No” in Sections 1 or 2. Deficient items must be corrected in a timely manner.

[illegible]

Safety Coordinator \_\_\_\_\_ Date \_\_\_\_\_

## EXCAVATION PLANNING CHECKLIST

This checklist shall only be used by JVIII when self-performing excavation activities and shall be completed by JVIII excavation competent person during excavation activities. Personnel shall be permitted to enter excavations only after the JVIII Excavation Entry Permit has been completed, authorized by the excavation competent person, and posted at the excavation entrance.

### GENERAL INFORMATION

Project/Site Name: \_\_\_\_\_ Project Number: \_\_\_\_\_  
Name/Location of Excavation: \_\_\_\_\_  
Scope of Work Description: \_\_\_\_\_  
Excavation Depth: \_\_\_\_\_ Excavation Width: \_\_\_\_\_

### PRIOR TO EXCAVATING

- ☐ Personnel meet training and medical surveillance requirements
- ☐ Dig permit obtained, where required by client/facility
- ☐ Client, installation owners, and utility companies contacted for exact location of underground utilities/installations
- ☐ Detection equipment used when exact location of underground utilities is unknown
- ☐ Soils to be excavated have been classified: ☐ Stable Rock ☐ Type A ☐ Type B ☐ Type C
- ☐ Combination, describe: \_\_\_\_\_

**NOTE: If soils unclassified, assume to be Type C**

- ☐ Groundwater table and stormwater run-off evaluated
- ☐ Area evaluated for existence of ordnance explosives (OE) and unexploded ordnance (UXO)

The Environmental Compliance Coordinator (ECC) should be consulted for the following requirements:

- ☐ Soils characterized where contamination may be present
- ☐ USDA (or local equivalent) soil permit obtained for soil transport
- ☐ Excavation evaluated for wetlands, endangered species, cultural/historic resources
- ☐ ACOE/CWA 404 (or local equivalent) permit obtained for wetland areas
- ☐ Stockpile management plan prepared to address national, state, and local regulations
- ☐ Waste discharge/NPDES (or local equivalent) permit obtained for excavation dewatering
- ☐ Storm Water Pollution Prevention or Erosion & Sediment Control Plan prepared, where required

### GENERAL REQUIREMENTS

- ☐ Daily safety briefing/meeting conducted with excavation personnel
- ☐ Guardrails provided on walkways over excavation 6' (1.5 m in Australia) or deeper
- ☐ Barriers provided at excavations 6' (1.5 m in Australia) or deeper when not readily visible
- ☐ Barriers/covers provided for wells, pits, shafts, or similar excavation 6' (1.5 m in Australia) or deeper
- ☐ Earthmoving equipment operated safely (use earthmoving equipment checklist in HS-27)
- ☐ Personnel provided with and wearing appropriate PPE

### EXCAVATING ACTIVITIES

- ☐ Rocks, trees, and other unstable surface objects removed or supported
- ☐ Exposed underground utility lines supported
- ☐ Undermined surface structures supported or determined to be in safe condition
- ☐ Warning system used to remind equipment operators of excavation edge
- ☐ Stockpile covers/liners and excavation silt fences/covers provided, where required (consult ECC)
- ☐ Fugitive dust suppressed

## PROTECTIVE SYSTEMS USE

- ☐ Protective systems used for excavations 5' (1.5 m) or deeper, unless stable rock
- ☐ Protective systems for excavation deeper than 20' (6.1 m) designed by registered PE
- ☐ Protective systems used: ☐ Sloping ☐ Shoring ☐ Trench Box ☐ Combination  
Describe: \_\_\_\_\_
- ☐ Sloping cut to appropriate angle of incline for soil classification (if unclassified, assume Type C soil)
- ☐ Shoring/trench boxes used according to manufacturer recommendations and not subjected to loads exceeding design limits
- ☐ Protective system components securely connected to prevent movement or failure
- ☐ Protective systems inspected daily and free from damage
- ☐ Defective protective systems replaced or corrected
- ☐ Personnel removed from shielding systems when installed, removed, or during vertical movement

## PROTECTIVE SYSTEM REMOVAL and BACKFILLING

- ☐ Protective system removal starts and progresses from excavation bottom
- ☐ Protective systems removed slowly and cautiously
- ☐ Temporary structure supports used if failure of remaining components observed
- ☐ Backfilling taking place immediately after protective system removal
- ☐ Backfill certified clean when required by client or local regulation (consult ECC)

## EXCAVATING AT HAZARDOUS WASTE SITES

- ☐ Waste disposed of according to Health & Safety Plan and RCRA regulations
- ☐ Appropriate decontamination procedures being followed, per Health & Safety Plan

## EXCAVATING AT ORDNANCE EXPLOSIVES SITES

- ☐ OE plan prepared and approved by JVIII UXO Safety Officer
- ☐ OE/UXO avoidance provided, access routes cleared, and boundaries marked prior to excavation
- ☐ Personnel remain inside marked boundary
- ☐ Earthmoving equipment does not excavate closer than 1' (30.5 cm) to anomalies

JVIII Excavation Competent Person Name: \_\_\_\_\_

JVIII Excavation Competent Person Signature: \_\_\_\_\_

Date Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_

## H&S Self-Assessment Checklist - EARTHMOVING EQUIPMENT

This checklist shall be used by AGVIQ-CH2MHILL Joint Venture III (JVIII) personnel **only** and shall be completed at the frequency specified in the project's HSP.

This checklist is to be used at locations where: 1) JVIII employees are potentially exposed to hazards associated with earthmoving equipment operations (complete Sections 1 and 3), and/or 2) JVIII oversight of a earthmoving equipment subcontractor is required (complete entire checklist).

HSO or designate may consult with earthmoving equipment subcontractors when completing this checklist, but shall not direct the means and methods of equipment operations nor direct the details of corrective actions. Earthmoving equipment subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the health and safety manager for review.

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_

Location: \_\_\_\_\_ PM: \_\_\_\_\_

Auditor: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

This specific checklist has been completed to:

- ☐ Evaluate JVIII employee exposures to earthmoving equipment hazards  
☐ Evaluate a JVIII subcontractor's compliance with earthmoving equipment H&S requirements  
Subcontractors Name: \_\_\_\_\_

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the earthmoving equipment subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-27.

<b><u>SECTION 1</u></b>	<b><u>Yes</u></b>	<b><u>No</u></b>	<b><u>N/A</u></b>	<b><u>N/O</u></b>
<b>PERSONNEL SAFE WORK PRACTICES (3.1)</b>				
1. Only authorized personnel operating earthmoving equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Personnel maintaining safe distance from operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Personnel and equipment operator in close communication when personnel must be in proximity of operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personnel approach operating equipment safely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Personnel wearing high-visibility and/or reflective vests when close to operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel riding only in seats of equipment cab and using seat belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Personnel not positioned under hoisted loads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Personnel not hoisted by equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Personnel instructed not to approach equipment that has become electrically energized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Personnel wearing appropriate PPE, per HSP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## H&S Self-Assessment Checklist - EARTHMOVING EQUIPMENT

	<u>SECTION 2</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<b>GENERAL (3.2.1)</b>					
11. Daily safety briefing/meeting conducted with crew		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Daily inspection of equipment and equipment accessories conducted before use		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. At least one fire extinguisher available at the equipment operating area		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EARTHMOVING EQUIPMENT COMPONENTS (3.2.2)</b>					
14. Backup alarm or spotter used when backing equipment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Operational horn provided on bi-directional equipment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Seat belts are provided and used		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Rollover protective structures (ROPS) provided		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Braking system capable of stopping full payload		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Headlights and taillights operable when additional light required		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Brake lights in operable condition		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Cab glass provides no visible distortion to the operator		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Hauling equipment (dump trucks) provided with cab shield or canopy		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Dump truck beds provided with positive means of support during maintenance or inspection		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Dump truck operating levers provided with latch to prevent accidental dumping		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EARTHMOVING EQUIPMENT PLACEMENT (3.2.3)</b>					
25. Location of underground utilities identified		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Safe clearance distance maintained while working under overhead powerlines		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Safe distance is maintained while traveling under powerlines		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Unattended equipment visibly marked at night		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Parking brake set when equipment parked and equipment chocked when parked on incline		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EARTHMOVING EQUIPMENT OPERATION (3.2.4)</b>					
30. Equipment operated on safe roadways and grades		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Equipment operated at safe speed		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Equipment not operated during inclement weather, lightning storms		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Using equipment to lift loads, other than earth, done according to equipment manufacturer specifications		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Lifting and hauling capacities are not exceeded		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Equipment components lowered when not in use		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. All machine guards are in place		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Air monitoring conducted per HSP/FSI for hazardous atmospheres		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EARTHMOVING EQUIPMENT MAINTENANCE (3.2.5)</b>					
38. Defective components repaired immediately		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Suspended equipment or equipment parts are supported prior to work under or between		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Lockout/tagout procedures used prior to maintenance		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Tires on split rims removed using safety tire rack or cage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Good housekeeping maintained on and around equipment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EXCAVATING AT HAZARDOUS WASTE SITES (3.2.6)</b>					
43. Waste disposed of according to HSP		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Appropriate decontamination procedures being followed, per HSP		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## H&S Self-Assessment Checklist - EARTHMOVING EQUIPMENT

### SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

[illegible]

Safety Coordinator \_\_\_\_\_ Date \_\_\_\_\_

## HS&E Self-Assessment Checklist - EXCAVATIONS

This checklist shall be used by AGVIQ-CH2MHILL JVIII personnel **only** and shall be completed at the frequency specified in the project's HSP.

This checklist is to be used at locations where: 1) JVIII employees enter excavations (complete Sections 1 and 3), and/or 2) JV1 oversight of an excavation subcontractor is required (complete entire checklist).

The HSO or designate may consult with excavation subcontractors when completing this checklist, but shall not direct the means and methods of excavation operations nor direct the details of corrective actions. Excavation subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the health and safety manager for review.

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_

Location: \_\_\_\_\_ PM: \_\_\_\_\_

Auditor: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

This specific checklist has been completed to:

- ☐ Evaluate JV1 employee exposures to excavation hazards
  - ☐ Evaluate a JV1 subcontractor's compliance with excavation HS&E requirements
- Subcontractor Name: \_\_\_\_\_

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the excavation subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-32.

### SECTION 1

Yes   No   N/A   N/O

#### **PERSONNEL SAFE WORK PRACTICES (4.1)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Competent person has completed daily inspection and has authorized entry                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Personnel aware of entry requirements established by competent person                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Protective systems are free from damage and in stable condition                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Surface objects/structures secured from falling into excavation                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Potential hazardous atmospheres have been tested and found to be at safe levels          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Precautions have been taken to prevent cave-in from water accumulation in the excavation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel wearing appropriate PPE, per HSP/FSI   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## HS&E Self-Assessment Checklist - EXCAVATIONS

	<u>SECTION 2</u>	Yes	No	N/A	N/O
<b>GENERAL (4.2.1)</b>					
8. Daily safety briefing/meeting conducted with personnel		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Excavation and protective systems adequately inspected by competent person		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Defective protective systems or other unsafe conditions corrected before entry		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Guardrails provided on walkways over excavation 6' or deeper		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Barriers provided at excavations 6' or deeper when not readily visible		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Barriers or covers provided for wells, pits, shafts, or similar excavation 6' or deeper		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Excavating equipment operated safely (use earthmoving equipment checklist in HS-27)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PRIOR TO EXCAVATING (4.2.2)</b>					
15. Location of underground utilities and installations identified		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Soils characterized prior to excavation where contamination may be present		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Excavation area checked for wetlands, endangered species, cultural/historic resources		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Stockpile construction and management plan		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. ECC consulted and plan established for wastewater disposal from excavation dewatering		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. SWPPP prepared for construction site 1-5 acres (depending on project location)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EXCAVATING ACTIVITIES (4.2.3)</b>					
21. Rocks, trees, and other unstable surface objects removed or supported		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Exposed underground utility lines supported		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Undermined surface structures supported or determined to be in safe condition		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Warning system used to remind equipment operators of excavation edge		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Stockpile, excavation covers, liners, silt fences in place, where required		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Fugitive dust suppressed		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EXCAVATION ENTRY (4.2.4)</b>					
27. Trenches > 4' deep provided with safe means of egress within 25'		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Structure ramps designed and approved by competent person		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Potential hazardous atmospheres tested prior to entry		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Rescue equipment provided where potential for hazardous atmospheres exists		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Ventilation used to control hazardous atmospheres and air tested frequently		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Appropriate respiratory protection used when ventilation does not control hazards		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Precautions taken to prevent cave-in from water accumulation in the excavation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Precautions taken to prevent surface water from entering excavation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Protection provided from falling/rolling material from excavation face		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Spoil piles, equipment, materials restrained or kept at least 2' from excavation edge		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EXCAVATION PROTECTIVE SYSTEMS (4.2.5)</b>					
37. Protective systems used for excavations 5' or deeper		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Protective systems for excavation deeper than 20' designed by registered PE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. If soil unclassified, maximum allowable slope is 34 degrees		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Protective systems free from damage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Protective system used according to manufacturer recommendations and not subjected to loads exceeding design limits		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Protective system components securely connected to prevent movement or failure		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Cave-in protection provided while entering/exiting shielding systems		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Personnel removed from shielding systems when installed, removed, or vertical movement		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PROTECTIVE SYSTEM REMOVAL (4.2.6)</b>					
45. Protective system removal starts and progresses from excavation bottom		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Protective systems removed slowly and cautiously		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Temporary structure supports used if failure of remaining components observed		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Backfilling taking place immediately after protective system removal		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**EXCAVATING AT HAZARDOUS WASTE SITES (4.2.7)**

49. Waste disposed of according to HSP and RCRA regulations

☐☐☐☐

50. Appropriate decontamination procedures being followed, per HSP

☐☐☐☐**BACKFILL (4.2.8)**

51. Backfill certified clean when required by client or local regulation

☐☐☐☐**FORMS/PERMITS (4.3)**

52. Waste discharge/NPDES permit obtained for excavation de-watering, where required

☐☐☐☐

53. Dig permit obtained, where required by client/facility

☐☐☐☐

54. USDA soil permit obtained (for south/southeast and coastal states)

☐☐☐☐

## HS&E Self-Assessment Checklist - EXCAVATIONS

### SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

[illegible]

Safety Coordinator \_\_\_\_\_ Date \_\_\_\_\_

## HS&E Self-Assessment Checklist—Waste Characterization, Sampling and Analysis

This checklist shall be used by AGVIQ-CH2M HILL Joint Venture III (JVIII) personnel **only** and shall be completed at the frequency specified in the project's Work Plan.

This checklist is to be used at locations where: 1) JVIII employees will be managing wastes generated on project sites and/or 2) JVIII provides oversight of subcontractor personnel who are managing wastes generated at project sites.

The Safety Coordinator (SC) may consult with subcontractors when completing this checklist, but shall not direct the means and methods of waste characterization, sampling and analysis operations nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: _____		Project No.: _____	
Location: _____		PM: _____	
Person filling out checklist: _____		Title: _____ Date: _____	
This specific checklist has been completed to:			
<input type="checkbox"/> Evaluate JVIII compliance with its waste characterization, sampling and analysis standard (SOP-79).			
<input type="checkbox"/> Evaluate a JVIII subcontractor's compliance with the waste characterization, sampling and analysis standard and its requirements			
Subcontractors Name: _____			

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-42.

	Yes	No	N/A	N/O
<b>GENERAL WASTE CHARACTERIZATION INFORMATION (6.0)</b>				
1. Personnel told not to sign waste documentation (e.g., manifests) unless specifically authorized by the client in writing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Waste Management Plan developed and available to all project personnel (see HSE-78).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Waste characterized before it is generated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Waste characterized by Client using generator information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Waste volumes estimated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Disposal facility sampling and analytical requirements identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Disposal facility evaluated (see HSE-78).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Waste stream characterization documented in project file.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IDENTIFY ANALYTICAL TEST METHODS (7.1)</b>				
9. Nature and quantity of the waste determined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Analyses required for transport, treatment, and disposal determined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Detection limits identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Provide disposal facility with analytical results.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Analytical test methods identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>SAMPLING (7.2)</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>N/O</b>
14. Developed a sampling plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Field activities recorded in a logbook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Exceptions to sampling plan documented in field logbook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Each container labeled with the project name, number, sample ID number, date and time,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. The label on the container is covered with clear tape to prevent loss. collected sampler's name, sample preserves, analysis to be performed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CHAIN OF CUSTODY (COC)</b>				
19. Sample shipping containers sealed with two custody seals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Custody seals placed over the left and rights sides of the container's cover (cooler).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Each seal signed and dated (with time).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Seals are covered with clear tape to prevent loss.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Custody seals placed on sample container immediately after collection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Custody seals must be placed in a manner that they must be broken to open sample container.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. The sample is in custody ( in view or physical possession, it has not been tampered with, it is retained in a secured area with restricted access, it is placed in a container and secured with an official seal such that it cannot be reached without breaking the seal).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CHAIN OF CUSTODY FORM INSTRUCTIONS (7.2.5)</b>				
26. Chain of Custody form completed per instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>RECORDS (7.2.6)</b>				
27. Original COC submitted to the lab along with final data packages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Official copy of COC form sent to the project chemist and lab with sample shipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Changes to analytical requests on COC form or the PO made in writing to the lab.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. A copy of written change sent to PM, lab, and placed in project files.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Reasons for change are included in sample log and project file.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Sample logbooks, sample logs, and COC forms sent to PM at completion of project activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## H&S Self-Assessment Checklist—Waste Characterization, Sampling and Analysis

Complete this section for all items checked “No” in Sections 1 or 2. Deficient items must be corrected in a timely manner.

[illegible]

Safety Coordinator \_\_\_\_\_ Date \_\_\_\_\_

## Attachment 5

### Drug Free Work Place Program

# Drug-Free Workplace

JVIII does not tolerate illegal drugs, or any use of drugs, controlled substances, or alcohol that impairs an employees work performance or behavior. JVIII has established a policy that its employees and subcontractors will not be involved in any manner with the unlawful manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace. The use or possession of alcohol in the workplace is also prohibited. Any violation of these prohibitions may result in discipline or immediate discharge. Please reference SOP 105, *Drug-Free Workplace Standard of Practice*, for more information. The following sections describe mandatory program requirements.

## Policy Statement

A policy statement is required for the Drug-Free Workplace Program. The policy statement should detail prohibited conduct and ramifications, and:

Prohibit drug, alcohol, and/or controlled substances use or abuse

Prohibit involvement in the manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace

Describe disciplinary actions

Stipulate that subcontractor will pay for all testing

## Subcontractor Management

All lower-tiered subcontractors must comply with the provisions of this program.

If a subcontractor's employee has a confirmed positive test result, the subcontractor is required to notify JVIII of test result within 24 hours and provide written documentation that the employee has been removed from the site.

Employees testing positive will be removed from the JVIII project and not allowed to return for a minimum of six months, and then only upon providing a negative drug screen result.

Subcontractor is responsible for maintaining their own records. JVIII requires that the subcontractor submit the names of their employees who have confirmed negative test results on company letterhead, certifying that the employees have met the Drug-Free Workplace Program requirements. JVIII reserves the right to audit the subcontractor's program and records at any time.

Site visitors are not required to be drug tested but must be escorted by someone who has been tested. Site visitors are employees who visit a site for a day or less and who are accompanied by a site manager/supervisor. Site visitors are employees who observe the project and are not exposed to significant HS&E hazards. The SC-C must be involved in determining whether an employee is considered a site visitor.

## Drug and Alcohol Testing

Testing will be conducted for all substances listed below. If the results exceed the level list, a confirmation sample will be conducted with a gas chromatography/mass spectrometry (GC/MS). If the GC/MS levels exceed those listed, the results will be reported to the Medical Review Officer (MRO).

**TABLE 7-1**  
Drug Levels

Substance	Screening Threshold Level	Confirmation Threshold Level
	(EMIT)	(GC/MS)
Amphetamines	1000 ng/ml	500 ng/ml
Cocaine Metabolite	300 ng/ml	150 ng/ml
Opiates	2000 ng/ml	2000 ng/ml
Phencyclidine (PCP)	25 ng/ml	25 ng/ml
Marijuana	50 ng/ml	15 ng/ml
Alcohol, Ethyl	0.02 gm/dl	0.04 gm/dl

Alcohol testing will be performed in accordance with the FMCSA Alcohol & Drug Testing Regulations using breath alcohol testing equipment and procedures. Two alcohol tests are required to determine if a person has a prohibited alcohol concentration. A screening test is conducted first, with any result less than 0.02 gm/dl considered a “negative” result. If the alcohol concentration is greater than 0.02 gm/dl, a second confirmation test must be conducted. Confirmation breath alcohol tests greater than 0.04 gm/dl are considered a “positive” result.

Only a Breath Alcohol Technician (BAT) may be used for breath alcohol testing, unless applicable state licensing or other requirements mandate blood tests or unless testing facilities are not available for breath sampling. When blood alcohol testing is used, each presumptive positive result must be confirmed by a second analysis using a GC/MS.

## **Prescription and Non-Prescription Drugs**

Employees using prescription or non-prescription drugs that could impair their functions on the project are required to notify the employer in advance of such drug use.

Failure to report prescription and non-prescription drugs as required above, illegally obtaining the substance, or use that is inconsistent with the prescription or label may be subject to disciplinary action.

## **Types of Testing**

### **General Requirements**

Pre-hire, pre-assignment and random testing will only entail drug testing, while all other types of testing must include drug and alcohol testing.

Employees who refuse to submit to drug or alcohol testing will be treated as if they tested positive and will be disciplined accordingly.

Prior to drug or alcohol testing, the employee must sign a consent form. Copies of this form must be maintained on file by the subcontractor.

A candidate will be eliminated from employment consideration for tampering with, altering, or attempting to create a false negative result.

### **Pre-Hire, Pre-Assignment Testing**

Employees working on the Project are required to submit to a pre-assignment test for drugs. The test must be taken within 30 days of the employee’s arrival date at the project.

Subcontractor is responsible for maintaining their own records. JVIII requires that the subcontractor submit the names of their employees who have confirmed negative test results on company letterhead, certifying that the employees have met the Drug-Free Workplace Program requirements. JVIII reserves the right to audit the subcontractor's program and records at any time.

A positive test for a potential new hire or existing employee will result in eliminating the person for consideration for assignment to the project.

Applicants and existing employees who do not successfully pass the drug test may be reconsidered for assignment to the project after 6 months.

## **Random Testing**

JVIII reserves the right to randomly tests program participants.

## **Post-Incident Testing**

At a minimum, post-incident testing is required following an incident on the project that results in an injury in the course of employment requiring treatment from a doctor, or following an incident that results in property damage over US \$1,000.

Post-incident testing may be required under other circumstances as dictated by the CM, PM, HSM, HSO, or MEC Support Officer.

Post-incident testing will include both drug and alcohol testing.

## **Cause or Reasonable Suspicion Testing**

When the company or JVIII believe there is cause for reasonable suspicion that an employee has taken drugs or consumed alcohol while at work or returned to duty with drugs or alcohol in their body, the employee will be required to immediately submit to drug and/or alcohol tests.

Management must approve "for cause" or "reasonable suspicion" testing prior to requiring an employee to submit to the test.

The subcontractor must maintain written documentation that supports the need for reasonable suspicion testing.

Employees who are required to submit to reasonable suspicion testing will be entitled to request the presence of a Union steward, provided a Union steward is readily available (within one hour or less) and the circumstances allow. The employee's employer will be responsible for contacting the craft steward.

Employees who are required to submit to reasonable suspicion testing must submit to the test immediately after the determination has been made. Employees are prohibited from transporting themselves to the collection site.

For cause testing will include both drug and alcohol testing.

## **Rehabilitation Follow-Up Testing**

If an employee enters a rehabilitation program, they will be subject to periodic testing for a period of up to 2 years upon their return to work.

The company will follow the MRO-recommended frequency for all follow-up testing.

## **Re-testing**

A dilute sample will be immediately re-tested. The employee's supervisor must escort the employee to the collection site for re-sampling.

The employee must be required to submit to the escorted test without prior warning.

A refusal to retest under these conditions will be considered a positive result and will be disciplined accordingly.

## **Notification of Results**

Positive test results must be reported to JVIII within 24 hours of notification from laboratory.

Employee's drug screen result must be kept confidential. Only company individuals with a work-related need to know will be given the results.

## **Searches and Inspections**

The subcontractor and JVIII must be able to conduct searches of project locations (vehicles, lockers, desks, filing cabinets, or equipment owned or being operated by subcontractor personnel) and employee's personal property (briefcases, purses, backpacks, coats, or vehicles). Employees and their property will be searched by local law enforcement.

JVIII must be notified prior to conducting a search.

Employees must sign a search consent and documentation form prior to having a search conducted of the employee's personal property. The subcontractor is responsible for maintaining this form which will also document findings of the search.

The employee will be entitled to request the presence of a Union steward, provided a Union steward is readily available (1 hour or less) and the circumstances allow.

A refusal to submit to, or cooperate with a search, will result in immediate removal from the project site.

## **Disciplinary Actions**

Employees who test positive for drugs or alcohol will be immediately removed from the project.

The company will determine appropriate action, including the level of discipline which includes actions ranging from providing an opportunity for entry into a rehabilitation or counseling program to suspension or dismissal.

## **Drug Program Service Provider**

Positive and/or inconclusive drug screen results must be reviewed by a licensed MRO.

The laboratory providing drug screen analysis must meet all federal, state, and local licensing requirements to provide drug screen analysis.

## **Employee Education**

Employees and supervisors must be provided with a Drug-Free Workplace Program and an Alcohol Education Awareness Program.

## Attachment 6

Material Safety Data Sheets  
(provided onsite)

## Attachment 7

### Chemical Specific Training Form



## CHEMICAL-SPECIFIC TRAINING FORM

Location:

Task Order:

HCC:

Trainer:

### TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

### REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:


The HCC will use the product MSDS to provide the following information concerning each of the products listed above.

- ☐ Physical and health hazards
- ☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- ☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants will have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and JVIII's written hazard communication program will be made available for employee review in the facility/project hazard communication file.

## Attachment 8

Project-Specific Chemical Product  
Hazard Communication Form H&S Forms/Permits

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SHSO will verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to JVIII and subcontractor personnel. Labeling and MSDS systems will also be explained.

### Task Order:

**MSDS's will be maintained at the following location(s):**

## Hazardous Chemical Products Inventory

[illegible]

Refer to SOP HS-107 *Hazard Communication* for more detailed information.

## Attachment 9

### Biological Hazard Fact Sheets

# Tick-Borne Pathogens

There are 6 notifiable tick-borne pathogens that present a significant field hazard, and in some areas account for more than half of our serious field incidents. These procedures should be applied during any field activity – even those field efforts that are predominantly paved but with bordering vegetation.

## Hazard Control

The methods for controlling exposure to ticks include, in order of most-preferred to least:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acaricide
- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventative antibiotic treatment after a bite is generally not recommended.

## Avoidance and Reduction of Ticks

To the extent practical, tick habitats should be avoided. In areas with significant tick infestation, consider stopping work and withdrawing from area until adequate tick population control can be achieved. Stopping and withdrawing should be considered as seriously as entering an area without proper energy control or with elevated airborne contaminants – tickborne pathogens present risk of serious illness!

In areas where significant population density or infestation exists, tick reduction should be considered. Tick reduction can be achieved by disrupting tick habitats and/or direct population reduction through the use of tick-toxic pesticides (Damminix, Dursban, Sevin, etc.).

Habitat disruption may include only simple vegetative maintenance such as removing leaf litter and trimming grass and brush. Tick populations can be reduced between 72 and 100% when leaf litter alone is removed. In more heavily infested areas, habitat disruption may include grubbing, tree trimming or removal, and pesticide application (Damminix, Dursban, Sevin, etc.). This approach is practical in smaller, localized areas or perimeter areas that require occasional access. Habitat controls are to be implemented with appropriate health and safety controls, in compliance with applicable environmental requirements, and may be best left to the property owner or tenant, or licensed pesticide vendor. Caution should be exercised when using chemical repellents or pesticides in or around areas where environmental or industrial media samples will be collected for analysis.

## Personal Protection

After other prevention and controls are implemented, personal protection is still necessary in controlling exposure to ticks. Personal protection must include all of the following steps:

So that ticks may be seen on your clothing wear light-colored clothing. Full-body New Tyvek (paper-like disposable coveralls) may also be used.

To prevent ticks from getting underneath clothing tuck pant legs into socks or tape to boots.

Wear long-sleeved shirts, a hat, and high boots.

Apply DEET repellent to exposed skin or clothing per product label.

Apply permethrin repellent to the outside of boots and clothing before wearing, per product label.

Frequently check for ticks and remove from clothing.

At the end of the day search your entire body for ticks (particularly groin, armpits, neck and head) and shower.

To prevent pathogen transmission through mucous membranes or broken/cut skin, wash or disinfect hands and/or wear surgical-style nitrile gloves anytime ticks are handled.

Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid hand-to-face contact, eating, drinking, smoking, etc. when applying or using repellents. Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMErix™ Lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

## **Tick Removal**

1. Use fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.
2. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. (If this happens, remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.)
3. Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva, hemolymph, gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.
4. Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immunocompromised persons may be at greater risk of infection and should avoid this procedure.
5. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.
6. You may wish to save the tick for identification in case you become ill. Your doctor can use the information to assist in making an accurate diagnosis. Place the tick in a plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

**Note:** Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided. In addition, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.

## **First-Aid and Medical Treatment**

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite site after removing embedded tick. Consult a healthcare professional if infection or symptoms and effects of tick-borne illnesses are develop.

Medical treatment for tick-borne infections include antibiotics and other medical interventions. Diagnosis of specific illness involves both clinical and laboratory confirmations. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

Previously infected individuals are not conferred immunity – re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

## **Hazard Recognition**

An important step in controlling tick related hazards is understanding how to identify ticks, their habitats, their geographical locations, and signs & symptoms of tick-borne illnesses.

### **Tick Identification**

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These tick varieties include:

- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick
- Rocky Mountain Wood Tick

These varieties and their geographical locations are illustrated on the following page.

### **Tick Habitat**

In eastern states, ticks are associated with deciduous forest and habitat containing leaf litter. Leaf litter provides a moist cover from wind, snow, and other elements. In the north-central states, is generally found in heavily wooded areas often surrounded by broad tracts of land cleared for agriculture. On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged (deer) tick and habitats are more diverse. Here, ticks have been found in habitats with forest, north coastal scrub, high brush, and open grasslands. Coastal tick populations thrive in areas of high rainfall, but ticks are also found at inland locations.

### **Illnesses and Signs & Symptoms**

There are six notifiable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite – normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

1. Lyme (bacteria)
2. RMSF (bacteria)
3. Ehrlichiosis (bacteria)
4. STARI (Southern Tick-Associated Rash Illness) (bacteria)
5. Tularemia (Rabbit Fever) (bacteria)
6. Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs & symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. A variety of long-term symptoms may result when untreated, including debilitating effects and death.

## Poison Oak (Ivy and Sumac too)

Reaction to Poison Oak is an allergic response and ranges from no reaction to a severe "rhus" dermatitis. Rhus is the class of poisonous plants which also includes poison ivy and poison sumac, mango, and other urushiol containing plants. 3 of 4 people will develop dermatitis on contact with urushiol.





Shrubs are usually 12" to 30" high, or a tree-climbing vine, with triple leaflets and short, smooth hair underneath. A project site in Portland had 8' tall poison oak bushes. Early berries are fuzzy and white; later, dun-colored. Plants are red and dark green in Spring and Summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in Fall, but the plant loses its (yellowed, then brown) leaves in Winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons.

Primary contamination results from contact with bruised or broken plant parts that release "toxicodendrol", an oily resin containing the toxic chemical "urushiol".

## Exposure to Poison Oak is Preventable

Exposure to poison oak often becomes an OSHA recordable illness. The dermatitis is so severe that many people seek medical care and get prescription cortisone creams to reduce the suffering caused by the itch.

## Exposure to Poison Oak is not an unavoidable part of working outdoors!



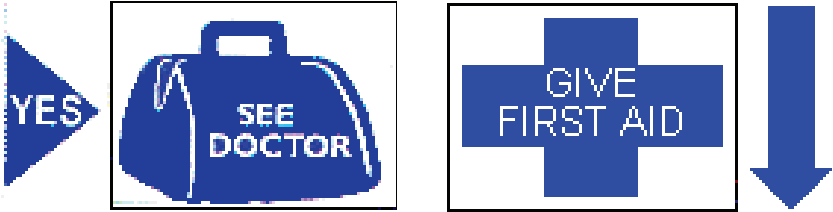


- Identify Poison Oak – The best way to prevent exposure is to recognize the plant and avoid working in areas where poison oak is present.
- If you must work in areas with poison oak, contact you project manager and health and safety manager to determine the best procedures to prevent contamination.
- Contamination with poison oak can happen through several pathways. These include
  - Direct skin contact with any part of the plant.
  - Contact with clothing that has been contaminated
  - Contact from removing shoes that have been contaminated. (your shoes are coated with oil)
  - Sitting in a vehicle that has become contaminated
  - Contact with any objects or tools that have become contaminated.
- If you must work on a site with poison oak the following precautions are necessary.
  -  • Do not drive vehicles onto the site where it will come into contact with poison oak. Vehicles which need to work in the area, such as drill rigs or heavy equipment must be washed as soon as possible after leaving the site.
  -  • All tools used in the poison oak area, including those used to cut back poison oak, surveying instruments used in the area, air monitoring equipment or other test apparatus must be decontaminated before they are placed back into the site vehicle. If on-site decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated.
  -  • Personal protective equipment, including tyvek coveralls, gloves, and boot covers must be worn. PPE must be placed into plastic bags and sealed if they are not disposed immediately into a trash receptacle.
  -  • As soon as possible following the work, shower to remove any potential contamination. Any body part with suspected or actual exposure should be washed with "Tecnu" or other product



designed for removing urushiol. If you do not have Tecnu wash with cold water. Do not take a bath, as the oils can form an invisible film on top of the water and contaminate your entire body upon exiting the bath.

- Tecnu may also be used to decontaminate equipment.
- If there is exposure use the following first aid procedures, or others you may find to alleviate the pain and itch.

## Poison Oak First Aid

<p>Are there any of these problems?</p> <ul style="list-style-type: none"> <li>• Swelling in the throat, tongue and/or lips</li> <li>• A hard time breathing or swallowing</li> <li>• Weakness, dizziness</li> <li>• Bluish lips and mouth</li> <li>• Unconsciousness</li> </ul>	
	<p>Use emergency kit with adrenalin, if available, and Get Emergency Care.</p>
<p>Do you have any of these problems?</p> <ul style="list-style-type: none"> <li>• Skin that is very bright red.</li> <li>• Pus.</li> <li>• Rash that has spread to the mouth, eyes or genitals.</li> <li>• Rash on large areas of the body or the face.</li> </ul>	
	<p>See Doctor and Give first aid before seeing doctor:</p> <ul style="list-style-type: none"> <li>• Take a hot shower (only after rash develops), put the rash area in hot water or pour hot water over it. Make sure the water is not too hot to burn the skin. The hot water causes itching at first, but brings relief later. Do not use soap.</li> <li>• Take an over-the-counter antihistamine, such as Benadryl, as stated on the label.</li> <li>• For weeping blisters: <ul style="list-style-type: none"> <li>• Mix 2 teaspoons of baking soda in 1 quarter (4 cups) of water.</li> <li>• Dip squares of gauze in this mixture.</li> <li>• Cover the blisters with the wet gauze for 10 minutes, four times a day. (Do not apply this to the eyes.)</li> </ul> </li> </ul>
	

## Self-Care/First Aid

- Make sure you wash all clothes and shoes with hot water and a strong soap. Also, bathe pets who have come in contact with poison ivy, oak or sumac. The sap can stay on pets for many days.
  - Keep your hands away from your eyes, mouth and face.
  - Do not scratch or rub the rash.
  - Apply any of these to the skin rash:
    - Calamine (not Caladryl) lotion
    - Zinc oxide ointment
    - Paste made with baking soda - mix 3 teaspoons of baking soda with 1 teaspoon of water
  - Take an over-the-counter antihistamine such as Benadryl, as stated on the label
- If self-care/first aid measures don't bring relief, call your doctor.

## Attachment 10

### Activity Hazard Analyses (AHAs)

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Land/Utility Surveys**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Land/Utility Surveying	Slips, trips, falls	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area (i.e. wet/muddy areas or slopes, system piping at floor level, unprotected holes, ditches, rip rap, utilities or other ground protrusions). Identify and avoid these areas. Wear sturdy hard toe work boots with sufficient ankle support.</li> <li>•</li> </ul>	Standard Level D PPE * * Appropriate work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection (as applicable)
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide fluids to prevent worker dehydration.</li> <li>• Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>• Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Standard Level D PPE (light colored clothing)
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to aircraft or other loud noise to wear hearing protection.</li> </ul>	Standard Level D PPE
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s). If sufficient lighting in the work area is not possible, additional sources of lighting must be provided.</li> </ul>	Standard Level D PPE
	Cuts & Abrasions	<ul style="list-style-type: none"> <li>• Wear long sleeve clothing and proper PPE (eye protection, hard hats, leather gloves, sturdy hard toe boots) when traversing through wooded areas.</li> </ul>	Standard Level D PPE
	Biological	<ul style="list-style-type: none"> <li>• Observe areas for presence of stinging or biting or stinging insects and nests such as spiders (widows/recluse), bee/wasp hives., fire ants mounds etc.)</li> <li>• Prior to starting field activities, notify supervisors of known allergies to stinging insects and location and quantity of antidote in the event the employee becomes incapacitated as a result of an insect bite.</li> <li>• Observe work area for presence of snakes (cottonmouth as primary, copperhead and rattlers as secondary).</li> <li>• Observe wetland/creek, river areas for presence of alligators</li> <li>• Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>• Protect yourself from and avoid exposure to blood bourne pathogens.</li> <li>• Exposure to some insect and reptile biological hazards may be temperature dependant</li> </ul>	Standard Level D PPE

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Land/Utility Surveys**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Land/Utility Surveying (cont.)	Other	<ul style="list-style-type: none"> <li>• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>• Avoid looking at lasers associated with survey equipment.</li> <li>• Shut down operations in heavy rain, wind and/or lightning.</li> <li>• Buddy System maintained for all phases of work.</li> <li>• Base or local Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>• Report all conditions which may create accidents, injury, illness or property damage to supervisors immediately.</li> </ul>	NA
<b>EQUIPMENT REQUIRED</b>		<b>INSPECTION REQUIREMENTS</b>	<b>TRAINING REQUIREMENTS</b>
<ul style="list-style-type: none"> <li>• First Aid Kits</li> <li>• Survey Instruments</li> <li>• Utility Location Equipment</li> </ul>		<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA/PTSP with all task personnel.</li> <li>• Review HSP.</li> <li>• Training per 29 CFR 1910.120 or other training as required for SoW tasks where exposure to site COCs may exist.</li> <li>• 1st Aid/CPR trained individual on-site.</li> <li>• Laser training for survey operators (depending on instrumentation).</li> </ul>

PRINT

SIGNATURE

Supervisor Name:

Date/Time:\_\_\_\_\_

Safety Officer Name:

Date/Time: \_\_\_\_\_

Site Personnel:

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Mobilization/Site Preparation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Mobilization/Site Preparation	Manual Lifting	<ul style="list-style-type: none"> <li>JVIII personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>Avoid carrying heavy objects above shoulder level.</li> </ul>	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/ roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices.</li> </ul>	Standard Level D PPE
	Noise	<ul style="list-style-type: none"> <li>Personnel exposed to loud working environments shall wear hearing protection.</li> </ul>	Standard Level D PPE
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Standard Level D PPE (light colored/weight clothing)
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast— be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	Standard Level D PPE Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> <li>Do not enter poorly lit areas without first providing portable illumination.</li> </ul>	Standard Level D PPE *
	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Secure flammable storage lock-up (vented) for flammable/combustible material storage.</li> <li>Use funnels and nozzles during fueling operations.</li> <li>Allow warm engine parts (small engines) to cool before refueling.</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>Review and be cognizant of NSFIH Fire Prevention Procedures and Requirements</li> </ul>	Standard Level D PPE

**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS - Mobilization/Site Preparation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Mobilization/Site Preparation (continued)	Struck/pinched	<ul style="list-style-type: none"> <li>Wear reflective warning vests or high visibility clothing.</li> <li>Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator.</li> <li>Understand and review hand signals. Designate one person to provide hand signals to equipment operators.</li> <li>Ensure equipment has operable back-up alarms.</li> <li>Avoid positioning between fixed objects and operating equipment.</li> </ul>	Standard Level D PPE
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Avoid contact with rodents.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Standard Level D PPE
	Electric Hazards	<ul style="list-style-type: none"> <li>If/when electrical extension cords are required to complete work, extension cords must be: <ul style="list-style-type: none"> <li>- Equipped with third-wire grounding.</li> <li>- Covered, elevated, or protected from damage when passing through work areas.</li> <li>- Protected from pinching if routed through doorways.</li> <li>- Not fastened with staples, hung from nails, or suspended with wire.</li> <li>- Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> </ul> </li> <li>- Rated to handle the voltage/amperage of equipment.</li> </ul>	Standard Level D PPE
	Other	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Verify underground utilities locations and ensure utilities are not in areas impacted by mobilization activities.</li> <li>Shut down operations in heavy rain and lightning.</li> <li>Buddy System maintained for all phases of work.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	NA



EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>• Track Excavator</li> <li>• Hauling Vehicles</li> <li>• Fire extinguisher(s) (fuel storage/equipment)</li> <li>• Flammable/ Combustible Storage Locker (placard)</li> <li>• Eye wash (small portable type)</li> <li>• First Aid/ Bloodborne pathogen/ CPR kit</li> <li>• Miscellaneous power and manual hand tools.</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>• Equipment inspections and maintenance.</li> <li>• Inspections of hand tools (power) and extension chords if used.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA with all task personnel</li> <li>• Review Site Specific HSP for new site personnel.</li> <li>• Review operations/safety manuals for all equipment utilized.</li> <li>• Behavior Based Loss Prevention Training (supervisors).</li> <li>• Power tool and equipment operators qualified by previous training or experience.</li> </ul>

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SIGNATURE

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Safety Officer Name: \_\_\_\_\_

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Installation of ESC Measures**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Installation of ESC Measures	Buried Objects	<ul style="list-style-type: none"> <li>• Contact Miss Utility of Maryland to secure a utility owner verification request number at (877) 257-7777 or at <a href="http://www.missutility.net">www.missutility.net</a> for utility clearance verification. Keep copies of any written documentation (faxes, email printouts) regarding utility location verification provided by utilities owners in the office project file and in a working field file on-site. Site Supervisor or SHSO shall photo document owner provided field utility mark-outs as related to proposed limits of ground disturbing activities prior to the start of work.</li> <li>• Conduct “third” party utility clearance when the locations of utilities may be in question.</li> <li>• Determine if NSFIH requires the acquisition of a base issued “dig permit” prior to undertaking any ground-disturbing activities. Where available, obtain utility diagrams for the facility. If possible, review proposed locations of intrusive work with NSFIH POCs knowledgeable in the location of utilities on the facility. Check locations against information from utility mark-out service.</li> <li>• Where unknown or unanticipated buried objects (i.e. drums, tanks, cylinders, munitions of explosive concern, soil with unusual staining or odor) are encountered during site operations, ongoing activities shall be immediately suspended.</li> <li>• Where unknown or unanticipated buried objects are encountered JVIII or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Consult with JVIII PM and HSM prior to resuming activities.</li> </ul>	<p>Level D PPE or as required by HSP and location of work*</p> <p>* Hardhat, safety glasses, sturdy hard toe work boots, reflective vest, leather gloves, hearing protection , face protection (as needed)</p>
	Cuts/Abrasions/ Bruises	<ul style="list-style-type: none"> <li>• Review and Implement Land Clearing AHA if chainsaw(s) or brush cutter(s) are required during the installation of ESC measures.</li> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp/cut edges or hand tools.</li> <li>• While installing ESC fencing stakes, position hands out of striking location of hammer. Use appropriately sized hammer for the installation of ESC fencing stakes.</li> <li>• Avoid the use of razor knives in cutting activities.</li> <li>• If using trenching equipment, keep hands, feet and arms away from activated drive chains or belts of trench. Stop trenching operations if personnel approach active trenching equipment.</li> <li>• Point staplers away from body during ESC fence construction/repair. Keep fingers and hands away from staple impact area.</li> <li>• Ensure that all machine guards are in place to prevent contact with drive belts rotary action devises/blades of trenching machine etc. Do not modify safety feature of the trenching machine.</li> </ul>	Level D PPE *
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>• Institute and maintain good housekeeping practices.</li> </ul>	Level D PPE *

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Installation of ESC Measures**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Installation of ESC Measures (cont.)	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> <li>Do not enter poorly lit areas without first providing portable illumination.</li> </ul>	Level D PPE *
	Manual Lifting	<ul style="list-style-type: none"> <li>JVIII personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift – especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>Avoid carrying heavy objects above shoulder level.</li> </ul>	Level D PPE *
	Noise	<ul style="list-style-type: none"> <li>Personnel exposed to loud working environments shall wear hearing protection.</li> </ul>	Level D PPE *
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Level D PPE * (light colored/weight clothing)
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	Level D PPE *Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary
	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be enrolled in a medical monitoring program.</li> <li>Follow PPE and action level requirements identified in sections 5.0 and 6.0, respectively, of the site specific HSP and project directions regarding the same.</li> </ul>	Level D PPE *
	Hand Tools	<ul style="list-style-type: none"> <li>Tools are to be inspected before use. Maintain all tools in a safe condition and do not modify tools</li> </ul>	Level D PPE *
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> <li>Do not enter poorly lit areas without first providing portable illumination.</li> </ul>	Level D PPE *

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Installation of ESC Measures**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Installation of ESC Measures (continued)	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Maintain flammable/combustible materials in flammable lock-up (vented) when not in use.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Allow warm engine parts (small engines) to cool before refueling.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Review and be cognizant of NSFIIH Fire Prevention Procedures and Requirements</li> </ul>	Level D PPE *
	Struck/pinched/ Caught -in-between	<ul style="list-style-type: none"> <li>• Wear reflective warning vests or high visibility clothing.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment.</li> <li>• Make/maintain eye contact with equipment operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator.</li> <li>• Avoid positioning between fixed objects and operating equipment.</li> </ul>	Level D PPE *
	Biological	<ul style="list-style-type: none"> <li>• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>• Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>• Avoid contact with rodents.</li> <li>• Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>• Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>• Avoid exposure to blood borne pathogens</li> </ul>	Level D PPE *
	Heavy Equipment	<ul style="list-style-type: none"> <li>• Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>• Avoid/take care around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>• Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>• Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Level D PPE *
	Other	<ul style="list-style-type: none"> <li>• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>• Verify underground utilities locations and ensure utilities are not in areas impacted by mobilization activities.</li> <li>• Shut down operations in heavy rain and lightning.</li> <li>• Buddy System maintained for all phases of work.</li> <li>• Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> </ul> <p>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately</p>	NA



**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS - Land Clearing (including grubbing)**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Land Clearing (inclusive of grubbing)	Struck/pinched by/caught between	<ul style="list-style-type: none"> <li>Workers shall stay out of the swing radius of heavy equipment. Ground personnel must make eye contact with equipment operator(s) before approaching heavy equipment. Do not approach operating heavy equipment from the rear.</li> <li>Evaluate the following before felling trees 1) anything that may cause damage/accident/injury when the tree falls 2) Evaluate the shape of tree(s), lean of the tree, and decayed or weak spots, 3) Evaluate wind force and direction, 4) the location of people, property utilities and 5) Electrical hazards.</li> <li>Use directional notching for tree felling (top cut ~60° angle to 20-25% tree diameter and bottom horizontal cut to meet termination point of top cut) before through-cutting of trunks/limbs.</li> <li>Keep all personnel clear of the drop zone of the limbs or the topped sections. Create sufficient buffer zone of non-essential ground support personnel. Second tree worker must evaluate drop zone radius of felled limbs and topped tree sections.</li> <li>Use only qualified and experienced personnel to perform land clearing and grubbing operations. Only operators qualified by experience or training to operate heavy equipment and chainsaws/brush cutters/hydraulic mowers.</li> <li>Make eye contact with (chain saw/equipment) operators before approaching work area or drop zone(s).</li> <li>When de-limbing a tree worker shall work on the side on which the limb is being cut, whenever possible. Prohibit cutting overhead, above shoulder height. For large limbs, begin limb reduction from the tip of the limb and move towards the tree trunk.</li> <li>Prohibit standing on, straddling logs while ground cutting. Stand uphill while ground cutting</li> <li>Start relieving cuts on compression side of log first, then make bucking cut on tension side.</li> <li>Workers should not hold logs while being cut</li> <li>Stop saw motor to remove saw if pinched. Don't pull on saw. Bend open cut (i.e. wedge) until saw comes free.</li> </ul>	<p>Level D PPE *</p> <p>* Hardhat, safety glasses, sturdy hard toe work boots, reflective vest, leather gloves, hearing protection , face protection , chainsaw chaps</p>
	Buried Objects	<ul style="list-style-type: none"> <li>For Grubbing Operations verify Miss Utility of Maryland dig excavation clearance notifications remain valid. Update notifications as may be required by Miss Utility of Maryland requirements.</li> <li>Where unknown or unanticipated buried objects are encountered JVIII or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Consult with JVIII PM and HSM prior to resuming activities.</li> </ul>	Level D PPE*
	Noise	<ul style="list-style-type: none"> <li>Personnel exposed to loud working environments shall wear hearing protection.</li> </ul>	Level D PPE*
	Cuts/Abrasions	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves and other PPE required for chainsaw/brush cutter operations</li> </ul>	Level D PPE*

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Land Clearing (including grubbing)**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Land Clearing (inclusive of grubbing) (cont.)	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices. Pick-up/consolidate removed felled vegetation from the work area, immediately.</li> <li>Ensure safe footing before starting/operating chainsaws.</li> <li>Identify and clear a safe escape route prior to engaging in tree felling operations.</li> </ul>	Level DPPE*
	Manual Lifting	<ul style="list-style-type: none"> <li>JVIII personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>Avoid carrying heavy objects above shoulder level.</li> </ul>	Level DPPE*
	Overhead Utilities	<ul style="list-style-type: none"> <li>Maintain proper separation between Power Transmission Lines and over overhead utilities. See Electric Safety section for references to proper separation between operating equipment and power transmission lines/overhead utilities.</li> <li>Do not swing excavator boom toward overhead utilities. Be cognizant of utility pole guy wires.</li> </ul>	
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Level DPPE*
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast— be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	Level DPPE*  Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> <li>Do not enter poorly lit areas without first providing portable illumination.</li> </ul>	Level DPPE*

**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS - Land Clearing (including grubbing)**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Land Clearing (inclusive of grubbing) (cont.)	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be enrolled in a medical monitoring program where grubbing operations occur in the defined excavation limits of the NTRCA.</li> <li>Follow PPE and action level requirements identified in sections 5.0 and 6.0, respectively, of the site specific HSP and project directions regarding the same.</li> </ul>	Level D PPE*
	Hand Tools	<ul style="list-style-type: none"> <li>Tools are to be inspected before use. Maintain all tools in a safe condition and do not modify tools</li> </ul>	Level D PPE*
I	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Use funnels and nozzles during fueling operations.</li> <li>Allow warm engine parts (small engines) to cool before refueling.</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>Review and be cognizant of NSFIIH Fire Prevention Procedures and Requirements</li> </ul>	Level D PPE*
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Avoid contact with rodents.</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Level D PPE*
	Heavy Equipment	<ul style="list-style-type: none"> <li>Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>Avoid/take care around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Level D PPE*
	Other	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Verify underground utilities locations and ensure utilities are not in areas impacted by mobilization activities.</li> <li>Shut down operations in heavy rain and lightning.</li> <li>Buddy System maintained for all phases of work.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	





**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Precharacterization of Waste (in-situ) via Hand Auger**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Pre-characterization of Waste (in-situ )	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained in accordance with 29CFR1910.120 and been rolled in a medical monitoring program.</li> <li>Perform Air Monitoring as identified in section 5.0 of the HSP. Follow PPE and action level requirements identified in the site specific HSP.</li> <li>Where site conditions change or action levels are exceeded contact the HSM for consultation.</li> <li>Pregnant or potentially pregnant JVIII personnel to review Standard of Practice HSE-120, Reproductive Protection before performing any hazardous or potentially hazardous duty.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas.</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection as necessary for task.</p> <p>D<sub>1</sub> : D + hand protection (inner and outer chemical resistant gloves)</p> <p>D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers, face protection (as needed)</p>
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast– be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary</p>

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Precharacterization of Waste (in-situ) via Hand Auger**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Pre-characterization of Waste (in-situ )	Manual Lifting	<ul style="list-style-type: none"> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of JVIII or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift – especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Buried Objects	<ul style="list-style-type: none"> <li>For in-situ soil precharacterization sampling activities verify Miss Utility of Maryland dig excavation clearance notifications remain valid. Update notifications as may be required by Miss Utility of Maryland requirements.</li> <li>Where unknown or unanticipated buried objects are encountered JVIII or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Consult with JVIII PM and HSM prior to resuming activities.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Avoid contact with rodents.</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Other	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Buddy System maintained for all phases of work.</li> <li>Shut down operations in heavy rain and lightning.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	NA

**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS - Precharacterization of Waste (in-situ) via Hand Auger**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools/Hand Auger Sample containers/cooler <ul style="list-style-type: none"> <li>First Aid Kits</li> <li>Fire Extinguishers(fuel storage/equipment)</li> <li>Portable eye wash station</li> </ul>		<ul style="list-style-type: none"> <li>Weekly Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)</li> <li>Visual Inspections of designated work areas to identify and address hazardous conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Review AHA with all task personnel</li> <li>Review Site Specific HSP for new personnel.</li> <li>Behavior Based Loss Prevention Training (supervisors).</li> <li>1<sup>st</sup> Aid/CPR , 29CFR1910.120</li> </ul>

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**Supervisor Name:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Safety Officer Name:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Site Personnel:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Excavation and Management**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Soil Excavation and Management	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained in accordance with 29CFR1910.120 and been rolled in a medical monitoring program.</li> <li>Perform Air Monitoring as identified in section 5.0 of the HSP. Follow PPE and action level requirements identified in the site specific HSP.</li> <li>Where site conditions change or action levels are exceeded contact the HSM for consultation.</li> <li>Pregnant or potentially pregnant JVIII personnel to review Standard of Practice HSE-120, Reproductive Protection before performing any hazardous or potentially hazardous duty.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas.</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection as necessary for task.</p> <p>D<sub>1</sub> : D + hand protection (inner and outer chemical resistant gloves)</p> <p>D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers, face protection (as needed)</p>
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices.</li> <li>Avoid walking on polyethylene sheeting of stockpiles to the extent possible, especially when wet. Use 2 people minimum to cover soil stockpiles and secure additional personnel when windspeed is greater than 5 mph (estimated).</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast– be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary</p>

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Excavation and Management**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Soil Excavation and Management (Cont.)	Stuck by/Pinched Caught in Between	<ul style="list-style-type: none"> <li>Sufficient separation between ground support personnel and the operating heavy equipment must be maintained.</li> <li>Wear reflective vests or high visibility clothing to promote visibility of ground personnel by equipment operators.</li> <li>Isolate equipment swing areas from workers, fixed objects or other equipment. Ground personnel shall avoid positioning themselves between fixed objects, operating equipment. Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. Stay out of the swing radius of operating heavy equipment.</li> <li>Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>Ensure equipment has operable back-up alarms.</li> <li>Step away from heavy equipment when adjustments (positioning) are made.</li> <li>Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> </ul>	
	Manual Lifting	<ul style="list-style-type: none"> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of JVIII or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift – especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Use funnels and nozzles during fueling operations.</li> <li>Allow warm engine parts (small engines) to cool before refueling.</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>Maintain flammable/combustible materials in flammable lock-up when not in use.</li> <li>Review and be cognizant of NSF-IH Fire Prevention Procedures and Requirements</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Heavy Equipment	<ul style="list-style-type: none"> <li>Seat belts or other restraint system shall be used by heavy equipment operators.</li> <li>Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>Use caution around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Excavation and Management**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Soil Excavation and Management (Cont.)	Buried Objects	<ul style="list-style-type: none"> <li>For soil excavation/removal activities verify Miss Utility of Maryland dig excavation clearance notifications remain valid. Update notifications as may be required by Miss Utility of Maryland requirements.</li> <li>Where unknown or unanticipated buried objects are encountered JVIII or subcontractor personnel shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Consult with JVIII PM and HSM prior to resuming activities.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Avoid contact with rodents.</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Overhead Utilities	<ul style="list-style-type: none"> <li>Maintain proper separation between Power Transmission Lines and over overhead utilities. See Electric Safety section for references to proper separation between operating equipment and power transmission lines/overhead utilities.</li> <li>Do not swing excavator boom toward overhead utilities. Be cognizant of utility pole guy wires.</li> </ul>	
	Noise	<ul style="list-style-type: none"> <li>Wear hearing protection in loud work environments.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Other	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Buddy System maintained for all phases of work.</li> <li>Shut down operations in heavy rain and lightning.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> </ul> <p>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</p>	NA

<p align="center"><b>JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)</b></p> <p align="center"><b>ACTIVITY HAZARD ANALYSIS – Soil Excavation and Management</b></p>	
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Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Track Excavator /Skid Loader • First Aid Kits • Fire Extinguishers (fuel storage/equipment) • Portable eye wash station		• Weekly Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers) • Visual Inspections of designated work areas to identify and address hazardous conditions.	• Review AHA with all task personnel • Review Site Specific HSP for new personnel. • Behavior Based Loss Prevention Training (supervisors). • 1st Aid/CPR , 29CFR1910.120

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**Supervisor Name:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Safety Officer Name:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Site Personnel:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Loading and T&D**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Soil Loading & T&D	Chemical Exposure	<ul style="list-style-type: none"> <li>All personnel performing this task shall be trained in accordance with 29CFR1910.120 and been rolled in a medical monitoring program.</li> <li>Perform Air Monitoring as identified in section 5.0 of the HSP. Follow PPE and action level requirements identified in the site specific HSP.</li> <li>Where site conditions change or action levels are exceeded contact the HSM for consultation.</li> <li>Pregnant or potentially pregnant JVIII personnel to review Standard of Practice HSE-120, Reproductive Protection before performing any hazardous or potentially hazardous duty.</li> <li>Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water) without first donning proper PPE.</li> <li>Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas.</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection as necessary for task.</p> <p>D<sub>1</sub> : D + hand protection (inner and outer chemical resistant gloves)</p> <p>D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers, face protection (as needed)</p>
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices.</li> <li>Avoid walking on polyethylene sheeting of stockpiles to the extent possible, especially when wet. Use 2 people minimum to cover soil stockpiles and secure additional personnel when wind speed is greater than 5 mph (estimated).</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast– be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary</p>

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Loading and T&D**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Soil Loading & T&D (Cont.)	Stuck by/Pinched Caught in Between	<ul style="list-style-type: none"> <li>• Sufficient separation between ground support personnel and the operating heavy equipment must be maintained.</li> <li>• Wear reflective vests or high visibility clothing to promote visibility of ground personnel by equipment operators.</li> <li>• Isolate equipment swing areas from workers, fixed objects or other equipment. Ground personnel shall avoid positioning themselves between fixed objects, operating equipment. Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. Stay out of the swing radius of operating heavy equipment.</li> <li>• Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>• Ensure equipment has operable back-up alarms.</li> <li>• Step away from heavy equipment when adjustments (positioning) are made.</li> <li>• Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> </ul>	
	Manual Lifting	<ul style="list-style-type: none"> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of JVIII or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift – especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Fire Prevention	<ul style="list-style-type: none"> <li>• Use only metal safety cans for storage and transfer of fuel.</li> <li>• Use funnels and nozzles during fueling operations.</li> <li>• Allow warm engine parts (small engines) to cool before refueling.</li> <li>• Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>• Maintain flammable/combustible materials in flammable lock-up when not in use.</li> <li>• Review and be cognizant of NSFIIH Fire Prevention Procedures and Requirements</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Heavy Equipment	<ul style="list-style-type: none"> <li>• Seat belts or other restraint system shall be used by heavy equipment operators.</li> <li>• Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>• Use caution around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>• Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>• Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Loading and T&D**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Soil Loading & T&D (Cont.)	Haul Trucks	<ul style="list-style-type: none"> <li>Stay clear of operating envelop of haul trucks. All haul trucks should be equipped with an operational backing alarm.</li> <li>Haulage trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots or provided a spotter.</li> <li>When approaching a haul area, employees should make eye contact and communicate their intentions directly with the haul truck operator. Do not assume drivers see you.</li> <li>Verify haul trucks stay on designated haul roads.</li> <li>Do not approach haul trucks from the rear or other blind spots.</li> <li>Haul truck drivers to remain in cab during loading. Do not allow haul truck drivers to set loaded soil while covering loads before shipment.</li> </ul>	
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Avoid contact with rodents.</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Overhead Utilities	<ul style="list-style-type: none"> <li>Maintain proper separation between Power Transmission Lines and over overhead utilities. See Electric Safety section for references to proper separation between operating equipment and power transmission lines/overhead utilities.</li> <li>Do not swing excavator boom/loader bucket toward overhead utilities. Be cognizant of utility pole guy wires positions. Verify haul trucks have sufficient clearance under overhead utilities. Do not raise dump bodies near over head utilities.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Noise	<ul style="list-style-type: none"> <li>Wear hearing protection in loud work environments.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)**  
**ACTIVITY HAZARD ANALYSIS – Soil Loading and T&D**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Soil Loading & T&D (Cont.)	Other	<ul style="list-style-type: none"> <li>• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>• Buddy System maintained for all phases of work.</li> <li>• Shut down operations in heavy rain and lightning.</li> <li>• Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>• Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	NA
<b>EQUIPMENT REQUIRED</b>		<b>INSPECTION REQUIREMENTS</b>	<b>TRAINING REQUIREMENTS</b>
Track Excavator /Wheel Loader Haul Trucks <ul style="list-style-type: none"> <li>• First Aid Kits</li> <li>• Fire Extinguishers (fuel storage/equipment)</li> <li>• Portable eye wash station</li> </ul>		<ul style="list-style-type: none"> <li>• Weekly Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)</li> <li>• Visual Inspections of designated work areas to identify and address hazardous conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA with all task personnel</li> <li>• Review Site Specific HSP for new personnel.</li> <li>• Behavior Based Loss Prevention Training (supervisors).</li> <li>• 1<sup>st</sup> Aid/CPR , 29CFR1910.120</li> </ul>

**PRINT**

**SIGNATURE**

Supervisor Name:

Date/Time: \_\_\_\_\_

**Safety Officer Name:**

Date/Time: \_\_\_\_\_

**Site Personnel:**

Date/Time: \_\_\_\_\_

Date/Time: \_\_\_\_\_

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS – Site Restoration**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Site Restoration	Stuck by/Pinched Caught in Between	<ul style="list-style-type: none"> <li>Sufficient separation between ground support personnel and the operating heavy equipment must be maintained.</li> <li>Wear reflective vests or high visibility clothing to promote visibility of ground personnel by equipment operators.</li> <li>Isolate equipment swing areas from workers, fixed objects or other equipment. Ground personnel shall avoid positioning themselves between fixed objects, operating equipment. Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. Stay out of the swing radius of operating heavy equipment.</li> <li>Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/hoisting operations.</li> <li>Ensure equipment has operable back-up alarms.</li> <li>Step away from heavy equipment when adjustments (positioning) are made.</li> <li>Ensure heavy equipment operator has spotter for obstructed views and backing up.</li> <li>Do not place fingers between pipe joints when setting culvert pieces. Use pry bar if necessary.</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>D: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection as necessary for task.</p> <p>D<sub>1</sub> : D + hand protection (inner and outer chemical resistant gloves)</p> <p>D<sub>2</sub>: D<sub>1</sub>+ chemical resistant suits and boot covers, face protection (as needed)</p>
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices.</li> <li>Avoid walking on polyethylene sheeting of stockpiles to the extent possible, especially when wet. Use 2 people minimum to cover soil stockpiles and secure additional personnel when wind speed is greater than 5 mph (estimated).</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>Frequent intake of non- caffeinated to prevent dehydration.</li> <li>Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>Observe one (buddy system) another for initial signs of cold-related disorders.</li> <li>Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	<p>Modified Level D<sub>1</sub> or D<sub>2</sub> PPE or as required by HSP *</p> <p>Warm multi-layered clothing including hard hat liners and foul weather gear, as necessary</p>

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS – Site Restoration**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Site Restoration (Cont.)	Manual Lifting	<ul style="list-style-type: none"> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of JVIII or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift – especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Use funnels and nozzles during fueling operations.</li> <li>Allow warm engine parts (small engines) to cool before refueling.</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in work area.</li> <li>Maintain flammable/combustible materials in flammable lock-up when not in use.</li> <li>Review and be cognizant of NSF-IH Fire Prevention Procedures and Requirements</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP *
	Heavy Equipment	<ul style="list-style-type: none"> <li>Seat belts or other restraint system shall be used by heavy equipment operators.</li> <li>Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>Use caution around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Haul Trucks	<ul style="list-style-type: none"> <li>Stay clear of operating envelop of haul trucks. All haul trucks should be equipped with an operational backing alarm.</li> <li>Haulage trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots or provided a spotter.</li> <li>When approaching a haul area, employees should make eye contact and communicate their intentions directly with the haul truck operator. Do not assume drivers see you.</li> <li>Verify haul trucks stay on designated haul roads.</li> <li>Do not approach haul trucks from the rear or other blind spots.</li> <li>Haul truck drivers to remain in cab during loading. Do not allow haul truck drivers to set loaded soil while covering loads before shipment.</li> <li>Ground personnel shall not position themselves in the flipover radius of fill haul trucks</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP

**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS – Site Restoration**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Site Restoration (Cont.)	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Avoid contact with rodents.</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. Prior to starting field activities, <b>notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Avoid exposure to blood borne pathogens</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Overhead Utilities	<ul style="list-style-type: none"> <li>Maintain proper separation between Power Transmission Lines and over overhead utilities. See Electric Safety section for references to proper separation between operating equipment and power transmission lines/overhead utilities.</li> <li>Do not swing excavator boom toward overhead utilities. Be cognizant of utility pole guy wires positions.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Noise	<ul style="list-style-type: none"> <li>Wear hearing protection in loud work environments.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP
	Material Handling	<ul style="list-style-type: none"> <li>Only one person shall signal the equipment operator during material handling/lifting operations. This person shall be able to communicate with the operator(s) with the appropriate hand signals.</li> <li>Rigging shall be inspected prior to use.</li> <li>Only load rated (tagged or labeled) rigging shall be utilized for lifting operations. User shall familiarize themselves with design load rate capacities (i.e. vertical, basket/cradle or choker applications) for the selected rigging.</li> <li>No one shall walk under or in front of suspended loads. Loads shall not be lifted over ground personnel.</li> <li>Tag lines shall be attached to every load being lifted. Tag lines will be used for all suspended loads so that riggers and tenders will not have to be in direct contact with any suspended load while controlling position or orientation. Ground personnel shall not place there hands on the suspended load. Make sure the load is stabilized and can not flip over prior approaching the load.</li> <li>Equipment operators shall not leave the cab of the equipment while they are lifting a load unless the load has been delivered to its intended transport location or the load has been fully secured (no potential for rolling onto or crushing ground personnel) and the equipment and controls are fully secured.</li> </ul>	Modified Level D <sub>1</sub> or D <sub>2</sub> PPE or as required by HSP



JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area) ACTIVITY HAZARD ANALYSIS – Site Restoration			
Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Site Restoration (Cont.)	Other	<ul style="list-style-type: none"> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Buddy System maintained for all phases of work.</li> <li>Shut down operations in heavy rain and lightning.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	NA
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Track Excavator /Skid Loader Haul Trucks <ul style="list-style-type: none"> <li>First Aid Kits</li> <li>Fire Extinguishers (fuel storage/equipment)</li> <li>Portable eye wash station</li> <li>Misc. hand tools</li> </ul>		<ul style="list-style-type: none"> <li>Weekly Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)</li> <li>Visual Inspections of designated work areas to identify and address hazardous conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Review AHA with all task personnel</li> <li>Review Site Specific HSP for new personnel.</li> <li>Behavior Based Loss Prevention Training (supervisors).</li> <li>1<sup>st</sup> Aid/CPR , 29CFR1910.120</li> </ul>

**PRINT**

**SIGNATURE**

Supervisor Name:

Date/Time: \_\_\_\_\_

**Safety Officer Name:**

Date/Time: \_\_\_\_\_

**Site Personnel:**

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**JVIII Task Order 005 – NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS – Demobilization**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Demobilization	Manual Lifting	<ul style="list-style-type: none"> <li>JVIII or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities, such that assigned work tasks/procedures maybe evaluated.</li> <li>When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible.</li> <li>Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>Avoid carrying heavy objects above shoulder level.</li> </ul>	Standard Level D PPE *  * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet floors/stairs, unprotected holes, utilities, ground/floor protrusions and other uneven surfaces. Use sturdy hard toe work boots with sufficient ankle support.</li> <li>Institute and maintain good housekeeping practices during all work.</li> </ul>	Standard Level D PPE*
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Provide and drink fluids to prevent worker dehydration.</li> <li>Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Standard Level D PPE*  (light colored/wt. clothing)
	Fire Prevention	<ul style="list-style-type: none"> <li>Use only metal safety cans for storage and transfer of fuel.</li> <li>Secure/placarded Flammable Locker for flammable or combustible materials storage</li> <li>Appropriately sized, easily accessible ABC fire extinguisher in all work areas or heavy equipment.</li> <li>Review and be cognizant of any specific NSFIH Fire Prevention Procedures and Requirements prior to performing any hot work activities (hot cutting, welding, grinding).</li> <li>properly dispose of waste/spent materials.</li> </ul>	Standard Level D PPE*
	Heavy Equipment	<ul style="list-style-type: none"> <li>Seat belts or other restraint system shall be used by heavy equipment operators.</li> <li>Perform daily maintenance and inspections on operating equipment. Keep documentation on site.</li> <li>Use caution around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear.</li> <li>Equipment shall only be operated by personnel qualified by prior training or experience.</li> <li>Ensure that a stable ground surface is available for the operation of heavy equipment.</li> </ul>	Standard Level D PPE
	Visible Lighting	<ul style="list-style-type: none"> <li>Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).</li> <li>Do not enter poorly lit areas without first providing portable illumination.</li> <li>Do not use non-explosion proof lighting in areas of flammable or combustible gases or liquids.</li> </ul>	Standard Level D PPE *
	Vehicular Traffic	<ul style="list-style-type: none"> <li>Exercise caution when exiting to or working near areas with vehicle traffic. Park in a manner that will allow for safe exit from vehicle, and park vehicle so that it can serve as a barrier, if need be.</li> <li>If the potential exists for injury by vehicle impact in the work area, provide physical barriers between workers and traffic or warning mechanisms (flag personnel, look-out) for work area personnel</li> </ul>	Standard Level D PPE *

**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS - Demobilization**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Demobilization (continued)	Biological	<ul style="list-style-type: none"> <li>Observe areas for presence of stinging or biting or stinging insects and nests (spiders, bee/wasp hives etc.) Prior to performing work on-site, notify supervisors of known allergies to stinging insects and location/quantity of antidote in the event the employee becomes incapacitated as a result of an insect bite.</li> <li>Avoid exposure to bloodborne pathogens. Use universal precautions for protection from exposure to bloodborne pathogens.</li> <li>Avoid contact with rodents.</li> </ul>	Standard Level D PPE*
	Struck/pinched	<ul style="list-style-type: none"> <li>Wear reflective warning vests or high visibility clothing around haul truck/traffic or operating equipment. In indoor environments where operating equipment is not present, or where personnel are in close proximity to rotary action or other mechanical process equipment that vests could become caught in, the use of reflective vests must be evaluated.</li> <li>Isolate workers from operating trucks/equipment and fixed objects.</li> <li>Make/maintain eye contact with operators or haul drivers before approaching. Do not approach equipment/haul trucks from rear or from blind spot of operator/driver. Do not position yourself behind haul trucks or equipment.</li> <li>Do not step in front of or under materials being unloaded.</li> <li>Avoid positioning between fixed objects and operating equipment.</li> <li>Haul truck operators must be informed of designated haul routes. Haul truck operators should ensure all persons are clear before operating trucks or equipment. Before moving, operators should sound horn or alarm. All equipment should be equipped with an operational backing alarm. Haul trucks or equipment with restricted visibility should be equipped with devices that eliminate blind spots. Employees should stay off haul roads. When approaching a haul area, employees should make eye contact and communicate their intentions directly with the driver. Do not approach vehicle from the rear.</li> </ul>	Standard Level D PPE*
	Power & Hand Tools	<ul style="list-style-type: none"> <li>Do not set tools on/in mud, water, soil or other surfaces that could cause malfunction of tools.</li> <li>Tools inspected before use. Maintain all tools in a safe condition.</li> <li>Electric cords must be free from defects.</li> <li>All required guards shall be in place and functional.</li> <li>Hand held powered tools equipped with constant pressure switch.</li> <li>Electric power actuated tools double insulated and properly grounded.</li> <li>Hoses or cords shall not be used to lower or hoist tools.</li> <li>Tools disconnected from energy source when not in use.</li> <li>Only personnel qualified by training or experience to use power tools.</li> </ul>	Standard Level D PPE *

**JVIII Task Order 005 - NSF-IH Site 6 (Fenced Area)  
ACTIVITY HAZARD ANALYSIS - Demobilization**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Demobilization (continued)	Other	<ul style="list-style-type: none"> <li>Do not entry fractionation tank (confined space) during site demobilization operations (Permit Required Confined Space)</li> <li>Establish portable/temporary eye wash station and acquire first aid/bloodborne pathogen/CPR kit for project site</li> <li>Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio <u>while driving</u> on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Shut down operations in heavy rain and lightning when in outdoor work environments.</li> <li>Buddy System maintained for all phases of work.</li> <li>Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately</li> </ul>	NA
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>Track excavator/skid steer</li> <li>Fire extinguisher(s)</li> <li>Haul Vehicles</li> <li>Eye wash (small portable type)</li> <li>First Aid/Bloodborne pathogen/CPR kit</li> <li>Miscellaneous power and manual hand tools.</li> </ul>		<ul style="list-style-type: none"> <li>Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>Equipment inspections and maintenance.</li> <li>Inspections of hand tools (power) and extension chords if used.</li> </ul>	<ul style="list-style-type: none"> <li>Review AHA with all task personnel</li> <li>Review Site Specific HSP for new site personnel.</li> <li>Review operations/safety manuals for all equipment utilized.</li> <li>Behavior Based Loss Prevention Training (supervisors).</li> <li>Power tool use by personnel qualified via previous training or experience.</li> </ul>

**PRINT**

**SIGNATURE**

Supervisor Name:

Date/Time: \_\_\_\_\_

**Safety Officer Name:**

Date/Time: \_\_\_\_\_

**Site Personnel:**

Date/Time:\_\_\_\_\_

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## Attachment 11

### Pre-Task Safety Plan


**DAILY PRE-TASK SAFETY PLAN (PTSP)**
**Page 1 of 3**

Project: Task Order 005 Location: NSF-IH Site 6 (Fenced Area) Date: \_\_\_\_\_

Site Safety & Health Officer: \_\_\_\_\_ Job Activity: Removal Action Site #: 005

Task Personnel:

List Tasks:

Tools/Equipment/Materials required (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools, cords, generators, compressed gases, regulated chemical products, etc.):

**Potential H&S Hazards, including chemical, physical, safety, biological and environmental (Check all that apply):**

<input checked="" type="checkbox"/> <b>Chemical contact</b> Maintain dermal protection, wash immediately if accidental contact occurs. Maintain good personal hygiene before eating, drinking, smoking. Air Monitoring via HSP. Avoid stepping in contaminated materials. Avoid soil contact with boots and clothing.	<input checked="" type="checkbox"/> <b>Overhead Electrical hazards</b> Maintain proper separation distance between heavy equipment, trucks and power transmission lines. Do not swing excavator boom toward lines. SEE Electrical safety in HSP for proper separation distances.	<input checked="" type="checkbox"/> <b>Elevated loads</b> Do not walk under or in front of suspended loads. Maintain eye contact with equipment operators. Avoid equipment swing radius, do not approach equipment from the rear.
<input type="checkbox"/> <b>Pressurized lines/equipment</b>	<input type="checkbox"/> <b>Overexertion</b>	<input type="checkbox"/> <b>Chemical splash</b>
<input type="checkbox"/> <b>Thermal burns</b>	<input checked="" type="checkbox"/> <b>Noise</b> Hearing protection for loud work environments.	<input type="checkbox"/> <b>Poisonous plants/insects</b>
<input type="checkbox"/> <b>Electrical</b>	<input checked="" type="checkbox"/> <b>Cuts/abrasions</b> From slips/trips/falls,	<input checked="" type="checkbox"/> <b>Eye hazards/flying projectile</b> Always wear eye protection
<input checked="" type="checkbox"/> <b>Weather conditions</b> Shutdown during visual verification of lightning and during adverse weather.	<input checked="" type="checkbox"/> <b>Spills</b> Avoid spillage during fueling ops. use funnels and nozzles.	<input checked="" type="checkbox"/> <b>Inhalation hazard</b> Perform dust monitoring. Provide dust suppression as necessary.
<input type="checkbox"/> <b>Explosion/fire</b>	<input type="checkbox"/> <b>Trench, excavations, cave-ins</b>	<input checked="" type="checkbox"/> <b>Heat/cold stress</b> Drink plenty of fluids.
<input checked="" type="checkbox"/> <b>Pinch points</b> Avoid positioning ground personnel between stationary objects and excavator bucket/boom. Watch finger pinch points against forms, concrete and existing Abutment 1 structure.	<input checked="" type="checkbox"/> <b>Slips, trip and falls</b> Walking on polysheeting. Minimum 2 people to cover piles/make stockpile laydowns. Utilize non windy times. Rock truck filled with sand prior to starting pile coving. Use excavator to secure stockpile covers.	<input checked="" type="checkbox"/> <b>Heavy equipment</b> Eye contact with heavy equipment operator and ensure operator has clear view of ground personnel prior to moving bucket. Wear reflective vests around operating heavy equipment. Step away during bucket adjustments. Designate one person to signal operator. Continue to perform equipment inspections & maintenance. Operate on firm level ground.
<input type="checkbox"/> <b>Heights/fall &gt; 6'</b>	<input checked="" type="checkbox"/> <b>Manual lifting</b> Minimum of 2 people lifting awkward & heavy objects.	<input type="checkbox"/> <b>Water/drowning hazard</b>
<input checked="" type="checkbox"/> <b>Radiation</b> Exposure to UV light without sun screen.	<input type="checkbox"/> <b>Ergonomics</b>	<input type="checkbox"/> <b>Aerial lifts/platforms</b>
<input type="checkbox"/> <b>Confined space entry</b>	<input type="checkbox"/> <b>Welding/cutting</b>	<input type="checkbox"/> <b>Demolition</b>

**Continue on page 3 of 3 (if necessary)**



**Hazard Control Measures (Check all that apply):**

<b>PPE</b> <input type="checkbox"/> Thermal/lined <input checked="" type="checkbox"/> Eye <input checked="" type="checkbox"/> Dermal/hand <input checked="" type="checkbox"/> Hearing <input type="checkbox"/> Respiratory <input checked="" type="checkbox"/> Reflective vests <input type="checkbox"/> Flotation device	<b>Protective Systems</b> <input checked="" type="checkbox"/> Locate buried/overhead utilities <input checked="" type="checkbox"/> Competent person <input type="checkbox"/> Daily inspections <input type="checkbox"/> Sloping <input type="checkbox"/> Shoring <input type="checkbox"/> Trench box <input type="checkbox"/> Barricades	<b>Fire Protection</b> <input checked="" type="checkbox"/> Fire extinguishers <input type="checkbox"/> Fire watch <input type="checkbox"/> Non-spark tools <input type="checkbox"/> Grounding/bonding <input type="checkbox"/> Intrinsically safe equipment <input type="checkbox"/> Combustible materials storage <input type="checkbox"/> Chemical Storage	<b>Electrical</b> <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Grounded <input type="checkbox"/> Panels covered <input type="checkbox"/> GFCI/extension cords <input type="checkbox"/> Power tools/cord inspected <input type="checkbox"/> Insulated tools/gloves <input checked="" type="checkbox"/> Proper separation from utilities
<b>Fall Protection</b> <input type="checkbox"/> Harness/lanyards <input type="checkbox"/> Adequate anchorage <input type="checkbox"/> Guardrail system <input type="checkbox"/> Covered opening <input type="checkbox"/> Fixed barricades <input type="checkbox"/> Warning system	<b>Air Monitoring</b> <input type="checkbox"/> PID/FID <input type="checkbox"/> Detector tubes <input type="checkbox"/> Radiation <input checked="" type="checkbox"/> Personnel sampling <input type="checkbox"/> LEL/O2 <input checked="" type="checkbox"/> Other	<b>Proper Equipment</b> <input type="checkbox"/> Aerial lift/ladders/scaffolds <input type="checkbox"/> Forklift/ Heavy equipment <input type="checkbox"/> Backup alarms <input checked="" type="checkbox"/> Hand/power tools <input type="checkbox"/> Crane w/current inspection <input type="checkbox"/> Proper rigging <input type="checkbox"/> Operator qualified	<b>Welding &amp; Cutting</b> <input type="checkbox"/> Cylinders secured/capped <input type="checkbox"/> Cylinders separated/upright <input type="checkbox"/> Flash-back arrestors <input type="checkbox"/> No cylinders in CSE <input type="checkbox"/> Flame retardant clothing <input type="checkbox"/> Appropriate goggles
<b>Confined Space Entry</b> <input type="checkbox"/> Isolation <input type="checkbox"/> Air monitoring <input type="checkbox"/> Trained personnel <input type="checkbox"/> Permit completed <input type="checkbox"/> Rescue provisions	<b>Medical/Emerg. Response</b> <input checked="" type="checkbox"/> First-aid & BBP kit <input checked="" type="checkbox"/> Eye wash <input checked="" type="checkbox"/> FA-CPR training <input checked="" type="checkbox"/> Route to hospital	<b>Heat/Cold Stress</b> <input checked="" type="checkbox"/> Work/rest regime <input checked="" type="checkbox"/> Rest area <input checked="" type="checkbox"/> Liquids available <input checked="" type="checkbox"/> Monitoring <input checked="" type="checkbox"/> Training	<b>Vehicle/Traffic</b> <input type="checkbox"/> Traffic Awareness <input type="checkbox"/> Traffic control <input type="checkbox"/> Barricades <input type="checkbox"/> Flags <input type="checkbox"/> Signs
<b>Permits</b> <input type="checkbox"/> Hot work <input type="checkbox"/> Confined space <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Excavation <input type="checkbox"/> Demolition <input type="checkbox"/> Energized work <input type="checkbox"/> Local/Environmental	<b>Demolition</b> <input type="checkbox"/> Pre-demolition survey <input type="checkbox"/> Structure condition <input type="checkbox"/> Isolate area/utilities <input type="checkbox"/> Competent person <input type="checkbox"/> Hazmat present	<b>Inspections</b> <input type="checkbox"/> Ladders/aerial lifts <input type="checkbox"/> Lanyards/harness <input type="checkbox"/> Scaffolds <input checked="" type="checkbox"/> Heavy equipment <input type="checkbox"/> Cranes and rigging <input checked="" type="checkbox"/> Other per Field Safety Plan	<b>Training</b> <input checked="" type="checkbox"/> Hazwaste <input checked="" type="checkbox"/> Construction <input checked="" type="checkbox"/> Equipment <input checked="" type="checkbox"/> Competent person <input checked="" type="checkbox"/> Task-specific (AHA) <input checked="" type="checkbox"/> Hazcom

Field Notes:

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Additional Space for Project Specific Hazard Awareness (if necessary):

- 1) Observe government/military facility posted speed limits.
- 2) Wear seat belts in equipment and vehicles while on government/military facilities. military facility access privileges.
- 3) Do not use cell phones or two way radios while driving or actively operating equipment on government/military facilities
- 4) Failure to do so may result in loss of driving privileges on government/military facilities
- 5) Report all accidents/injuries and property damage to the Project Manager and HSO immediately.
- 6) Maintain hospital route maps in site vehicles. Know facility EMS, Fire and Security dispatch #s.
- 7) Secure loads to hauling vehicle (pick-up truck) with appropriate rated tie down straps.
- 8) Use reflective vests/ high visibility clothing in high traffic areas or in areas were material handling operations are occurring

Attendees:

Name Printed:

Signature:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
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_____	_____
_____	_____

Meeting Conducted By:

_____	_____
Name Printed	Signature

## Attachment 12

### Loss Prevention Observation (LPO) Form

Loss Prevention Observation Form			
Project:		Observer:	Date:
Position/Title of worker observed:		Background Information/ comments:	
Task/Observation Observed: _____			
<ul style="list-style-type: none"> <li>Identify and reinforce safe work practices/behaviors</li> <li>Identify and improve on at-risk practices/acts</li> <li>Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards</li> <li>Proactive PM/Site Manager support facilitates eliminating/reducing hazards (material/personnel resources)</li> <li>Positive, corrective, cooperative, collaborative feedback/recommendations</li> </ul>			
Actions & Behaviors	Consistent w/ H&S Program	Not Consistent w/ H&S Program	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, AHA, PTSP, tailgate briefing, c., as needed)			<b>Positive Work Practices Observed:</b>
Personnel properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			<b>Questionable Activity/Condition Observed:</b>
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			<b>Actions/Comments:</b>
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			<b>Observed Worker's Corrective Actions/Comments:</b>
Other...			

**Attachment 13**  
**Incident Report Form**  
**Loss/Near Loss Incident Report Form**

# Root Cause Investigation

This attachment is provided to assist in accessing, completing, and reviewing an incident investigation. It is important to remember the following when conducting an investigation:

Gather relevant facts, focusing on fact-finding, not fault-finding.  
Draw conclusions, pitting facts together into a probable scenario.  
Determine incident root cause(s), the basic causes why an unsafe act/condition existed.  
Develop and implement solutions, matching all identified root causes with solutions.

## Documentation

The following should be included in the IRF to document the incident.

## Description

Provide a description of the event and the sequence of events and actions that took place prior to the incident. Start with the incident event and work backwards in time through all of the preceding events that directly contributed to the incident. The information should identify why the event took place as well as who was involved, when and where the event took place, and what actions were taken.

## Cause Analysis

Using the form and flowchart in this attachment the root cause of the incident will be determined. This form must be retained in the project and/or regional HS&E files.

**Immediate Causes**—List the substandard actions or conditions that directly affected the incident. The following are examples of immediate causes:

**Substandard Actions:** Operating equipment without authority; failure to warn; failure to secure; operating at improper speed; making safety device inoperable; using defective equipment; failing to use PPE; improper loading; improper lifting; improper position for task; under influence of alcohol or drugs; horseplay.

**Substandard Conditions:** Exposure to hazardous materials; exposure to extreme temperatures; improper lighting; improper ventilation; congestion; exposure to fire and explosive hazard; defective tools, equipment or materials; exposure to extreme noise; poor ventilation; poor visibility; poor housekeeping.

**Basic Causes**—List the personal and job factors that caused the incident. The following are examples of basic causes:

**Personal Factors:** Capability; knowledge; skill; stress; motivation.

**Job Factors:** Abuse or misuse; engineering; maintenance; purchasing; supervision; tools and equipment; wear and tear; work standards.

## Corrective Action Plan

Include all corrective actions taken or those that should be taken to prevent recurrence of the incident. Include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a time frame for completion. Be sure the corrective actions address the causes. For example, training may prevent recurrence of an incident caused by a lack of knowledge, but it may not help an incident caused by improper motivation.

The following are examples of management programs that may be used to control future incidents. These programs should be considered when determining specific corrective actions.

**Management Programs:** Accident/incident analysis; emergency preparedness; engineering controls; general promotion; group meetings; health control; hiring and placement; leadership and administration; management training; organizational rules; personal protective equipment; planned inspections; program audits; program controls; purchasing controls; task analysis and procedures; task observation.

## **Loss/Near-Loss Investigation Report Form**

### **Employer Information**

Company Name: \_\_\_\_\_

Project Name: \_\_\_\_\_ Task Order: \_\_\_\_\_

Project Location: \_\_\_\_\_

Task Location: \_\_\_\_\_

Job Assignment: \_\_\_\_\_

Preparer's Name: \_\_\_\_\_ Preparer's Employee Number: \_\_\_\_\_

### **Incident Specific Information**

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ a.m./p.m.

Location of incident:

☐ Company premises

☐ Field

☐ In Transit

☐

Other: \_\_\_\_\_

Address where the incident occurred: \_\_\_\_\_

Equipment Malfunction : Yes ☐ No ☐

Activity was a Routine Task: Yes ☐ No ☐

Describe any property damage: \_\_\_\_\_

Specific activity the employee was engaged in when the incident occurred:

\_\_\_\_\_  
\_\_\_\_\_

All equipment, materials, or chemicals the employee was using when the incident occurred:

\_\_\_\_\_  
\_\_\_\_\_

Describe the specific incident and how it occurred:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe how this incident may have been prevented:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contributing Factors (Describe in detail why incident occurred):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date employer notified of incident: \_\_\_\_\_ To whom reported: \_\_\_\_\_

**Witness Information (First Witness)**

Name: \_\_\_\_\_  
Employee Number \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code : \_\_\_\_\_  
Phone: \_\_\_\_\_

**Witness Information (Second Witness)**

Name: \_\_\_\_\_  
Employee Number \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code : \_\_\_\_\_  
Phone: \_\_\_\_\_

Additional information or  
comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

**A ROOT CAUSE ANALYSIS FORM MUST BE COMPLETED FOR ALL INJURIES AND ILLNESSES OR ACTUAL LOSSES.**

**COMPLETION OF THE ROOT CAUSE ANALYSIS FORM FOR NEAR LOSSES IS OPTIONAL, AT THE DISCRETION OF THE HEALTH AND SAFETY MAANGER.**





## Determination of Root Cause(s)

For losses or near losses the information may be gathered by the supervisor or other personnel immediately following the loss or near loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, to determine the root cause, and to develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must use the Root Cause Analysis Flow Chart to assist in identifying the root cause(s) of a loss. Any loss may have one or more "root causes" and "contributing factors". The "root cause" is the primary or immediate cause of the incident, while a "contributing factor" is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the *person* involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors". Causes that pertain to the *system* within which the loss or injury occurred should be referred to as "job factors".

### Personal Factors

1. Lack of skill or knowledge, lack of motivation
5. Correct way takes more time and/or requires more effort
6. Short-cutting standard procedures is positively reinforced or tolerated
7. Person thinks that there is no personal benefit to always doing the job according to standards

### Job Factors

2. Lack of or inadequate operational procedures or work standards.
3. Inadequate communication of expectations regarding procedures or standards
4. Inadequate tools or equipment

### Other

#### 8. Uncontrollable Factors \*

The root cause(s) could be any one or a combination of these seven possibilities or some other "uncontrollable factor". In the vast majority of losses, the root cause is very much related to one or more of these seven factors. \* **Uncontrollable factors should be used rarely and only after a thorough review eliminates "all" seven other factors.**

# Root Cause Analysis Form

## Root Cause Analysis (RCA)

Root Cause Categories (RCC): Select the RCC numbered below that applies for the root cause (RC) and/or contributing factor (CF) in the first column, then describe the specific root cause and corrective actions in each column.

1. Lack of skill or knowledge
2. Lack of or inadequate operational procedures or work standards
3. Inadequate communication of expectations regarding procedures or work standards
4. Inadequate tools or equipment
5. Correct way takes more time and/or requires more effort
6. Short-cutting standard procedures is positively reinforced or tolerated
7. Person thinks there is no personal benefit to always doing the job according to standards
8. Uncontrollable Factor (Note: Uncontrollable factors should be used rarely and only after a thorough review eliminates "all" seven other factors.)

RCC #	Root Cause(s)	Corrective Actions	RC <sup>1</sup>	CF <sup>2</sup>	Due Date	Completion Date	Date Verified

<sup>1</sup> RC = Root Cause; <sup>2</sup> CF = Contributing Factors (check which applies)

## Investigation Team Members

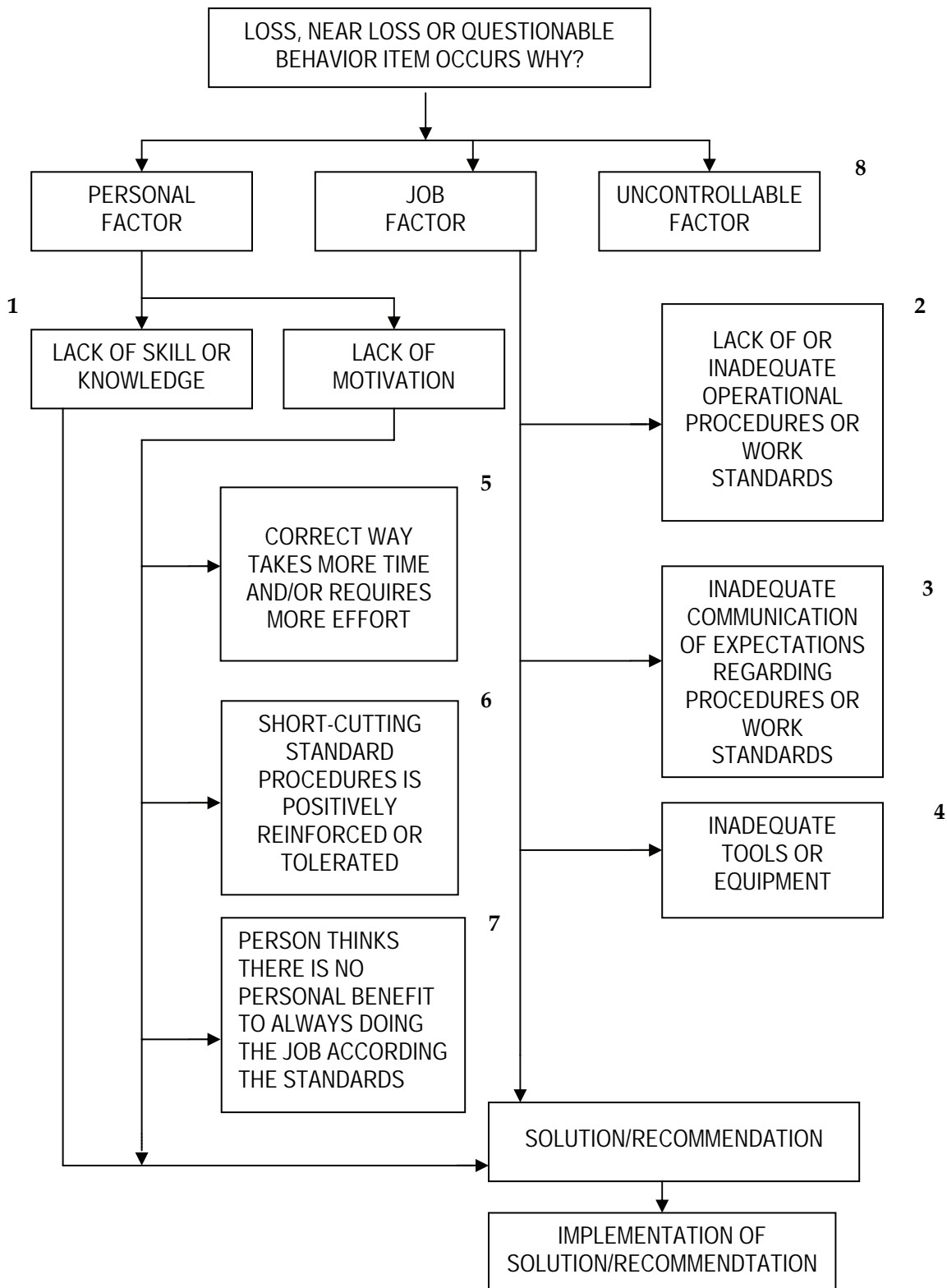
Name	Job Title	Date

## Results of Solution Verification and Validation


## Reviewed By

Name	Job Title	Date

## Root Cause Analysis Flow Chart



## Attachment 14

### Emergency Contact List

# Emergency Contact List

**CH2MHILL 24-hour Nurse Number 1-800-756-1130**

(See attached instructions \*)

<p><b>Medical, Fire/Spill, or Security Emergency</b></p> <p><b>On-base: 301-744-4333</b> (If in restricted area, use red call boxes – no cell phone usage in restricted area!)</p> <p><b>Off-base: 911</b></p> <p>See site Specific Hospital Route Maps for emergency contact information.</p>	<p><b>CH2M HILL- Medical Consultant</b>  Dr. Jerry H. Berke, M.D., M.P.H.  Health Resources  600 West Cummings Park, Suite 3400  Woburn, MA 01801-6350  781/938-4653 or 800/350-4511  (After hours calls will be returned within 20 minutes)  CH2MHILL Injury Management #: 1-800-756-1130.</p> <p><b>AGVIQ Medical Consultant(s)</b>  Refer to AQVIQ VBO office for a detailed list of Medical Facilities/contacts.</p>
<p><b>JVIII Program Director</b>  Name: Dave Leadenham AGVIQ  Phone: 757-318-9420 x19/ 757- 544- 6858 (cell)</p> <p><b>JVIII Technical Support</b>  Name: Stephen Matney  Phone: 757-318-9420 X 17</p>	<p><b>JVIII Deputy Program Manager</b>  Name: Steve Romanow/CH2M HILL  Phone: 703-376-5229</p> <p><b>JVIII Project Manager</b>  Name: Christine Metcalf/CH2M HILL  Phone: (703) 376-5193</p>
<p><b>AGVIQ Corporate Human Resources Department</b>  Name: Kristy Payne  TIKIGAQ Corp., Anchorage, AK  Phone: (907) 365 6242</p>	<p><b>CH2M HILL Corporate Human Resources Department</b>  Name: Pete Hannon, DEN  Phone: 303-771-0900</p>
<p><b>JVIII SHSO (primary)</b>  Name: Jesse Cox- AGVIQ  Cell Phone: 757-449-9262</p> <p><b>JVIII HSO</b>  Name: Glen Jackson - AGVIQ  Cell Phone: (757) 644 8293  Office Phone: (757) 318 9420 X 12</p>	<p><b>JVIII HSM</b>  Name: Richard Rathnow – CH2M HILL -ORO  Phone: (865) 483 9005 (572)  Cell: (865) 607 6734</p>
<p><b>AGVIQ Worker's Compensation &amp; Auto Claims</b>  Name: Kristy Payne  TIKIGAQ Corp. Anchorage, AK  Phone: (907) 365 6242</p> <p>AGVIQ personnel to report all accidents or injuries to AGVIQ Corporate HSM or HSO immediately but no later than 24 hrs. Fatalities and hospitalizations shall require immediate notification to AGVIQ Corporate HSM.</p>	<p><b>CH2MHill Worker's Compensation &amp; Auto Claims</b>  Sterling Administration Services  Phone: 800/420-8926 After hours: 800/497-4566</p> <p>Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.  Fatalities and hospitalizations shall require immediate notification to JVI HSM.</p>
<p><b>AGVIQ Corporate HSM</b>  Name: Troy Izatt  Office phone # (907) 365-6182  Cell phone # (907) 748-3697</p>	<p><b>Federal Express Dangerous Goods Shipping</b>  Phone: 800/238-5355</p> <p><b>Emergency Number for Shipping Dangerous Goods</b> Phone: 800/255-3924</p>
<p>Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.</p>	
<p><b>Facility Alarms:</b> Sound vehicle horn three times; All onsite contractors must read and sign the "Hazard Control Briefing for Environmental Division Visitors IHDIVNAVSURFAWARCEN", and attend the "Pre-construction Safety Briefing" from the Safety Department prior to commencing work.</p>	<p><b>Evacuation Assembly Area(s):</b>  Site trailer. Account for all team members.</p>
<p><b>Facility/Site Evacuation Route(s):</b> Developed site specific on-site prior to start of work</p>	
<p><b>Hospital Name/Address:</b> See site Specific Hospital Route Maps for emergency contact information.</p>	

## \* Emergency Nurse Assistance Instructions (CH2M HILL personnel only)

- After informing their supervisor ( JVIII Project Manager and/or Deputy Program Manager), the injured employee calls CH2M HILL's contracted Occupational Nurse.

### ***24-hour CH2M HILL Emergency Nurse Assistance***

***1-800-756-1130***

- The Occupational Injury Nurse listens to the injured employee to understand the injury/illness.
- Employee is provided guidance on appropriate treatment options (triage).
- If instructed to visit a medical facility by the Occupational Nurse, the Supervisor is responsible for instructing the injured employee to take a copy of the **CH2M HILL Initial Medical Treatment Form (Attachment # 14 – For Use by CH2M HILL Personnel Only)** with them to the physician, clinic or hospital.
- Appropriate treatment details are handled by the Occupational Injury Nurse, and Workers Compensation Groups.
- Nurse communicates and troubleshoots with and for employee through full recovery
- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the JVIII PM and JVIII HSM. Call emergency beeper number if HSM is unavailable.
- For work-related injuries or illnesses to CH2M HILL personnel, contact and help Human Resources administrator complete an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.

For JVIII subcontractor incidents, complete the Incident Report Form (IRF), Near Loss Investigation Report and Root Cause Analysis and submit to the JVIII PM and HSM.

*To be completed by CH2M HILL Supervisor – Send with employee visiting medical facility or forward within 24 hours.*

Employee name: \_\_\_\_\_ Date of Injury: \_\_\_\_\_  
Supervisor: \_\_\_\_\_ HS Representative: \_\_\_\_\_  
Visit Authorized by: \_\_\_\_\_ Phone #: \_\_\_\_\_

CH2M HILL Workers Compensation Administrator: Cambridge  
Send Bills to: CH2M HILL  
Attn: Jennifer Rindahl  
P.O. Box 22508  
Denver, Colorado 80222-0508

*To be completed by medical provider:*

Physician's name: \_\_\_\_\_ Phone #: \_\_\_\_\_  
Address: \_\_\_\_\_  
CH2M HILL employee: \_\_\_\_\_ has been treated for: \_\_\_\_\_

**It is the policy of CH2M HILL to provide temporary modified duty whenever possible for employees with physical restrictions resulting from an occupational injury or illness.**

Released to full duty

Released to restricted duty only (list restrictions below)

Out of work until \_\_\_\_\_ (date)

Please list any physical restrictions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Expected duration of restricted duty?

\_\_\_\_\_

**CH2M HILL would like the best and most efficient care extended to all our employees. Please recommend over-the-counter (OTC) medication as a suitable alternative when medically feasible.**

Prescribed medication: \_\_\_\_\_

Recommended OTC alternative: \_\_\_\_\_

Date of follow-up appointment: \_\_\_\_\_

Physician's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Please return this form to the injured employee and FAX to Health Resources at 1-800-853-2641.  
If you want to discuss the employee's work restrictions, please call the person listed in the "Visit Authorized by" field.





## **Attachment 15**

### **Site Specific Accident Prevention Plan**

# **Accident Prevention Plan Removal Action Work Plan for Site 6 (Fenced Area)**

**Naval Support Facility, Indian Head  
Indian Head, Maryland**

**Task Order 005**

**June 2008**

Prepared for

**Department of the Navy  
Naval Facilities Engineering Command Washington**

Under the

**JVIII Program  
Contract N40080-07-D-0301**

Prepared by



**AGVIO -CH2M HILL  
Joint Venture**

# Contents

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<b>Acronyms and Abbreviations .....</b>	<b>v</b>
<b>1.0 Signature Sheets .....</b>	<b>1-1</b>
<b>2.0 Background Information.....</b>	<b>2-1</b>
<b>3.0 Statement of Safety and Health Policy.....</b>	<b>3-1</b>
3.1 Objective .....	3-1
3.2 Purpose .....	3-1
3.3 Primary Environmental Health and Safety Program Functions.....	3-1
3.4 Safety Organization and Responsibility .....	3-1
3.5 Regulator Compliance Policy .....	3-3
3.6 Safety Goals.....	3-3
3.7 Safety Training.....	3-4
3.8 Medical Surveillance .....	3-4
3.9 Accident Investigation.....	3-4
3.10 Position Statement on Modified Work .....	3-4
3.11 Field Safety Inspections .....	3-5
3.12 First Aid .....	3-5
3.13 Review of Health and Safety Statistics .....	3-5
3.14 Specific Written Safety Procedures/Permits .....	3-5
3.15 State, OSHA, and Other Regulations.....	3-5
3.16 Changes.....	3-6
<b>4.0 Responsibilities and Lines of Authorities.....</b>	<b>4-1</b>
<b>5.0 Subcontractors and Suppliers .....</b>	<b>5-1</b>
5.1 Subcontractor/Supplier Coordination and Control.....	5-1
5.2 Subcontractor/Supplier Safety Responsibilities .....	5-1
<b>6.0 Training.....</b>	<b>6-1</b>
6.1 Safety Indoctrination Subjects .....	6-1
6.2 Mandatory Training and Certifications .....	6-1
6.3 Supervisory and Employee Safety Meetings.....	6-1
<b>7.0 Safety and Health Inspections .....</b>	<b>7-1</b>
<b>8.0 Safety and Health Expectations, Incentive Programs, and Compliance .....</b>	<b>8-1</b>
8.1 Company Safety Program Goals .....	8-1
8.2 JV/III Employee Safety Responsibility Requirements .....	8-1
8.3 Managers and Supervisors Safety Accountability .....	8-1
<b>9.0 Accident Reporting .....</b>	<b>9-1</b>
9.1 Exposure Data (Man-hours Worked) .....	9-1
9.2 Accident Investigations, Reports, and Logs .....	9-1
9.3 Immediate Notification of Major Incidents .....	9-1
<b>10.0 Medical Support .....</b>	<b>10-1</b>

<b>11.0</b>	<b>Personal Protective Equipment .....</b>	<b>11-1</b>
<b>12.0</b>	<b>Plans Required by the Safety Manual .....</b>	<b>12-1</b>
12.1	Hazard Communication Program.....	12-1
12.2	Emergency Response Plans .....	12-1
12.3	Layout Plans .....	12-1
12.4	Respiratory Protection Plan.....	12-1
12.5	Lead Abatement Plan .....	12-1
12.6	Asbestos Abatement Plan .....	12-1
12.7	Abrasive Blasting .....	12-2
12.8	Confined Space.....	12-2
12.9	Hazardous Energy Control Plan.....	12-2
12.10	Critical Lift Procedures .....	12-5
12.11	Contingency Plan for Severe Weather .....	12-5
12.12	Access and Haul Road Plan.....	12-5
12.13	Demolition Plan.....	12-5
12.14	Emergency Rescue (Tunneling) .....	12-5
12.15	Underground Construction Fire Prevention and Protection Plan .....	12-5
12.16	Compressed Air Plan.....	12-5
12.17	Form Work and Shoring Erection and Removal Plans.....	12-5
12.18	Lift Slab Plans .....	12-6
12.19	Health and Safety Plan.....	12-6
12.20	Blasting Plan .....	12-6
12.21	Diving Plan .....	12-6
12.22	Alcohol and Drug Abuse Prevention Plan.....	12-6
<b>13.0</b>	<b>Contractor Information to Meet the Requirements of the Major Sections of EM-385-1-1 .....</b>	<b>13-1</b>

# Acronyms and Abbreviations

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ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASTM	American Society for testing and Materials
CFR	Code of Federal Regulation
CIH	Certified Industrial Hygienist
CPR	cardiopulmonary resuscitation
EH&S	Environmental Health and Safety
EMT	emergency medical technician
HSP	Health and Safety Plan
JVIII	AGVIQ-CH2M HILL Joint Venture III
NIOSH	National Institute for Occupational Health
OM	Corporate Operations Manager
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
ROICC	Resident Officer in Charge of Construction
SHSO	Site Health and Safety Officer
TBD	to be determined

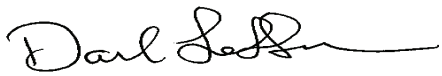
# 1.0 Signature Sheets

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## Plan Acknowledged By:

Name: David R. Leadenham, Program Manager  
Title: Program Manager  
Company: AGVIQ-CH2M HILL Joint Venture III  
Telephone: 757-318-9420 x19  
Fax: 757-318-9421

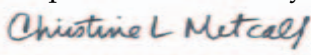
hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:   
David R. Leadenham, JV III Program Manager

## Designated Project Manager:

Name: Christine Metcalf  
Title: Project Manager  
Company: AGVIQ-CH2M HILL Joint Venture III  
Telephone: 703-376-5193  
Fax: 757-376-5693

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:   
Christine Metcalf, JV III Project Manger

## Designated Project Manager-Construction and Technical Support:

Name: Stephen J. Matney  
Title: Project Manager-Construction  
Company: AGVIQ-CH2M HILL Joint Venture III  
Telephone: 757-213-8583  
Fax: 757-318-9421

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:   
Thomas Cherrix, JV III Project Manger

**Site Health and Safety Officer (primary):**

Name: Glen Jackson  
Title: Health and Safety Officer  
Company: AGVIQ-CH2M HILL Joint Venture III  
Telephone: 757-644-8293  
Fax: 757-318-9421

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein:



Signature: \_\_\_\_\_  
Glen Jackson, Health and Safety Officer

**Site Health and Safety Officer (secondary):**

Name: Jesse Cox  
Title: Site Manager  
Company: AGVIQ-CH2M HILL Joint Venture III  
Telephone: 757-449-9262  
Fax: 757-318-9421

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein:



Signature: \_\_\_\_\_  
Jesse Cox, Site Manager



## 2.0 Background Information

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Background information for this project is detailed in the Health and Safety Plan (HSP), Section 1.1, Introduction.

## 3.0 Statement of Safety and Health Policy

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### 3.1 Objective

To provide a Safe Work Place for all employees by developing and administering an overall Environmental Health and Safety (EH&S) Program. To establish written policies and procedures that serve as vehicles through which the program will be implemented.

### 3.2 Purpose

This statement describes the AGVIQ/CH2M HILL Joint Venture III (JVIII) Health and Safety Program and the responsibilities of the supervisors, employees, and subcontractors. It will address applicable United States Occupational Safety and Health Administration (OSHA) standards set forth in 29 CFR 1910 and 29 CFR 1926 as well as various consensus standards and JVIII policies by the use of referenced procedures.

### 3.3 Primary Environmental Health and Safety Program Functions

The primary functions of the EH&S program are to:

- Define the health and safety responsibilities of JVIII personnel.
- Administer the medical surveillance program.
- Prepare the site safety plans.
- Provide safety training/maintaining training records.
- Provide safety procedures and protocols to be used at project sites, shops, and offices.
- Conduct accident investigations and maintaining records.
- Verify OSHA compliance under 29 CFR 1910 and 1926.
- Provide guidance and assistance with preparation of safety protocols for specific tasks.
- Promote safety and health consciousness within the company.
- Designate the functional organization of safety committees to serve corporate and project specific safety and health program needs.

### 3.4 Safety Organization and Responsibility

With JVIII, the safety and protection of employees, clients, and the community is the first priority. This concern for safety is not restricted to field operations but extends to

laboratories, the offices, and shop facilities. If an activity or condition is unsafe, the task will not proceed until the situation is corrected.

The **Company President** is the primary operational safety official in the company.

The **Corporate Operations Manager (COM)** administers the safety program for JVI and reports directly to the company president. The COM, or his designee, is responsible to support and assist site supervisors in executing the EH&S Program.

The **Site Health and Safety Officer (SHSO)** is responsible for administration and enforcement of the safety procedures and protocols on project sites. The SHSO is the primary safety official at the working level. The responsibility for safety is delegated and shared by project managers, alternate site safety officers, and subcontractors' supervisors. At a minimum, the SHSO must perform, or otherwise supervise the performance of, the following:

- Motivate employees and supervisors of subcontractors to adhere to JVI's safety policy in each work situation.
- Schedule, organize, and lead preparatory phase meetings prior to all activities relevant to definable features of work and have a working knowledge of the safe procedure for all jobs and tasks under their supervision. When in doubt, seek assistance prior to initiating a task. This is the only acceptable manner in which to perform the task. If the task cannot be accomplished safely, it will not be attempted.
- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works as instructed.
- Allocate sufficient time for the training and coaching of all employees to insure that everyone knows the correct procedure for safely accomplishing required tasks. New employees will not be allowed to perform any work until required training is completed.
- Immediately correct unsafe conditions that involve JVI employees or subcontractors.
- Ensure that employees are outfitted with and wear personal protective equipment as specified by this plan, EM385-1-1, and other JVI procedures.
- Set a good safety example.
- Obtain the cooperation of employees and sub-contractors. Subcontractor safety performance records will be verified prior to contract award and will be continually monitored during operations.
- Report all accidents, near misses and property damage in accordance with the Incident Management and Reporting Procedure.

**Every Employee**, regardless of job title, shares the responsibility for safety and should report any unsafe work condition without fear of reprisal. It is imperative that employees observe the following minimum requirements in order to achieve a safe and healthy workplace:

- Each employee must be familiar with this Accident Prevention Plan and the general safety rules herein.
- Each employee will practice safe procedures and follow all safety rules and regulations for the successful completion of any job task.
- All employees will wear the necessary personal protective equipment required for the job or task as specified by this plan, EM385-1-1, and other JVIH procedures.
- The employee will notify the immediate supervisor of any potential hazard or unsafe work practice that could result in injury or destruction of property.
- The employee will report all accidents to an immediate supervisor regardless of whether injury or property damage resulted. This includes all near misses (accidents without injury or damage). This requirement serves to bring unsafe conditions to the attention of management.
- Each employee will be subject to contraband search for safety purposes and for the safety of fellow employees.
- Violations of published safety policies and procedures may be cause for disciplinary actions up to and including dismissal.
- All employees who are taking prescribed medications that could affect work performance or might alter the manner in which they could be treated in an emergency will so advise their supervisor prior to beginning work.

### 3.5 Regulator Compliance Policy

The policy of JVIH will be to comply with all federal, state, local, and client regulations. It is the responsibility of all personnel to perform all work in full compliance with appropriate regulations. Safety and health personnel will immediately bring any condition regarding safety and health compliance to the attention of supervisory operating personnel.

JVIH will ensure regulatory compliance by all of its subcontractors, including OSHA 200 forms, safety records, OSHA training, and medical surveillance, when applicable.

### 3.6 Safety Goals

The goal of the safety and health program is to ensure a safe working environment, protect workers from harm, and protect the company from liability associated with an unsafe working environment.

Other goals are to eliminate workplace accidents, gain worker acceptance through cooperation and training, and provide our clients with a responsible, well-trained, safety-oriented work force.

JVIH has adopted a “zero accidents” goal for all operations. All activities will be planned and performed with this goal foremost.

### 3.7 Safety Training

JVIII engages in environmental remediation, construction, and other services, and must comply with numerous health and safety training requirements, mandated by governmental agencies, clients, and internal policies.

All personnel will be provided sufficient training to execute their jobs in a safe and healthy manner.

Direct supervisors are responsible to determine the training requirements of a task and ensure employees have the necessary training to complete the task safely. EH&S personnel will assist with this determination and training.

The corporate personnel department will maintain training records and documentation.

### 3.8 Medical Surveillance

All employees who perform work at hazardous waste sites or perform emergency response will be subject to the JVIII medical surveillance program. This program conforms to the requirements established by 29 CFR 1910.120/1926.65 (f) Medical surveillance and is titled EH&S Procedure 3-1, Occupational Health Examination Program.

### 3.9 Accident Investigation

All accidents will be thoroughly investigated by the supervisor of the person(s) involved in the accident. The employee and the site supervisor will forward a signed copy of the accident investigation form to the corporate health and safety office to comply with JVIII requirements.

The COM may investigate serious accidents, such as those involving hospitalization or injuries requiring more than one visit to a physician. The COM may also request that a specific written accident investigation be conducted in case of an unusual or serious injury or accident.

### 3.10 Position Statement on Modified Work

JVIII will attempt to eliminate all accidents through strict compliance with OSHA regulations and JVIII health and safety procedures, as well as supervisor and employee safety training, safety audits, and constant attention to safety. Should employee be injured or become ill in the course of and arising from his employment, JVIII will attempt to provide modified work. Modified work (light duty) will be made available in order to bring the injured employee back to the work environment, for the benefit of the employee and the company, whenever medically appropriate.

Employees are expected to return to modified work when medically capable. The work assigned to the injured employee will meet the restrictions set forth by the treating and/or company physician. Examples of modified work include but are not limited to office work, dispatching, and light shop work.

### 3.11 Field Safety Inspections

Weekly safety inspections will be made of the work area. The inspection will be made by the Project Manager and/or the SHSO, or a designated representative. These inspections are in addition to the daily inspections to be held by the SHSO and crew leaders. Discrepancies found during inspections will be corrected as soon as practicable. Serious safety violations shall be corrected immediately. Inspection records will be maintained in the safety log.

Additionally, the COM or his designated representative may make periodic unannounced inspections of work sites on their own discretion or at the request of an employee, supervisor, manager, or client.

### 3.12 First Aid

Each facility and work location must be evaluated to determine the potential requirement for medical emergencies. At a minimum, an industrial first-aid kit will be provided. An adequate number of employees with current certification in first aid and cardiopulmonary resuscitation (CPR) will be maintained on the project sites.

The SHSO will ensure that emergency medical attention is readily available. For emergency response and remediation operations, the SHSO should establish the requirement for medical emergency response and identify an emergency medical facility with chemical contamination trauma capability. If site conditions require, a subcontract emergency medical technician (EMT) and/or the availability of ambulance service on site should be implemented.

### 3.13 Review of Health and Safety Statistics

A designated representative from JV8888 will review and tabulate safety statistics as necessary:

- OSHA 300 form
- Workers' Compensation Experience Modification Ratings

### 3.14 Specific Written Safety Procedures/Permits

In order to provide a safe work place and communicate specific work requirements for regulatory compliance, specific tasks are incorporated by reference to this procedure. These procedures deal with specific areas such as confined space, hot work, lock out tag out, etc.

All JV8888 personnel who may be subject to these procedures will receive appropriate training and shall be held accountable for compliance with procedure requirements.

### 3.15 State, OSHA, and Other Regulations

Where state regulations differ from federal regulation cited in this plan, the more stringent regulation will apply.

## 3.16 Changes

Any user of this plan is welcome to recommend changes. Changes normally result from finding errors, regulatory changes, equipment modification, new equipment purchases, and changes to operation procedures or site conditions. The format for making a recommended change is:

Submit a written recommendation to the COM via your immediate supervisor. The COM will review the recommendation.

After review, the COM will determine if the suggestions should be included as an amendment or new procedure in this plan. Changes to this plan will be distributed immediately upon approval.

## 4.0 Responsibilities and Lines of Authorities

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The following listed JVIII personnel will have the authority to intervene and suspend work in the interest of safety policy compliance:

- Dave Leadenham                      JV III Program Manager
- Steve Romanow                      JV III Deputy Program Manger
- Christine Metcalf                      JV III Project Manager/Document Manager
- Stephen Matney                      JV III Project Manager/Construction/Technical Support
- Jesse Cox                      JV III Site Manager/Site Health and Safety Officer (Secondary)
- Glen Jackson                      JV III Site Health and Safety Officer (primary)

Safety responsibilities, accountability and lines of authority are further discussed in Section 2.1 of the HSP, Project Safety Responsibilities.



## 5.0 Subcontractors and Suppliers

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### 5.1 Subcontractor/Supplier Coordination and Control

JVIII subcontractors should be screened for safety performance and compliance with federal alcohol and drug testing requirements prior to being issued any contract for site work.

JVIII subcontractors will comply with the requirements for site safety as outlined in JVIII health and Safety Procedures.

### 5.2 Subcontractor/Supplier Safety Responsibilities

All subcontractor employees are subject to the same training and medical surveillance requirements as JVIII personnel depending on job activity. All activities involving the potential for exposure to hazardous waste materials will require medical and training certification as mandated by 29 CFR 1910.120. All subcontractor personnel will be required to sign in daily and be required to attend a daily meeting discussing operations and safety issues. All subcontractors involved in construction/remedial activities will complete a Subcontractor Pre-Job Safety Checklist prior to the start of work at the site. Subcontractors will submit Activity Analyses for their work activities to the JVIII SHSO. The subcontractor reports directly to the JVIII Project Manager. All incidents involving subcontractor employees will be reported to the JVIII Site Safety Officer and a copy of the subcontractor's injury/illness report will be submitted to the JVIII SHSO within 24 hours.

JVIII subcontractors are required to sign off and comply with all requirements of the JVIII Site-Specific Health and Safety Plan, which includes this Accident Prevention Plan (APP), Hurricane Preparedness Plan. Plans to address specific hazards may be added to the APP by during the course of work. JVIII subcontractors will be required to sign off and comply with any such supplemental plans. Contractors not in compliance should be immediately dismissed from the site.

Suppliers delivering various materials to the project site or providing equipment/equipment maintenance will comply with all rules and regulations specified by the owner. Supplier personnel will not be permitted into contaminated areas unless training and medical surveillance is in accordance with 29 CFR 1910.120. Contractors shall not ride on tractors, forklifts or similar vehicles unless specific seats are provided. They will follow Facility hot work rules if hot work is required for vehicle or equipment maintenance. Trucks will be loaded and unloaded in a safe and effective manner and materials will be stored safely in designated locations only. Associated packaging will be properly disposed of and litter will not be permitted to be scattered or blown from truck beds. Operators of mobile equipment on site must observe all traffic rules such as speed limits and right-of-ways of pedestrians.

## 6.0 Training

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### 6.1 Safety Indoctrination Subjects

Outlines of the site safety orientation for JVIII and subcontractor personnel and visitors are provided in Section 9.0 of the HSP, Training Requirements.

### 6.2 Mandatory Training and Certifications

Mandatory training and certifications are discussed in Section 9.0 of the HSP, Training Requirements.

All personnel entering an exclusion zone will be trained in the provisions of this Accident Prevention Plan and be required to sign the Accident Prevention Plan. Site-specific training for Site 22 is included in Section 9.0 of the HSP, Training Requirements.

### 6.3 Supervisory and Employee Safety Meetings

The JVIII SHSO will conduct daily safety meetings 'at the start of each work shift for on site personnel and will require subcontractors to follow similar meeting procedures or participate in the JVIII daily safety meetings.

## 7.0 Safety and Health Inspections

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The JVIII Project Manager and SHSO are required to perform site safety inspections using the Site Safety Inspection Checklist. The SHSO is responsible for conducting and preparing reports of daily safety inspections of work processes, site conditions, equipment conditions and submitting them for the project record. The SHSO will discuss any necessary corrective actions with the Project Manager and review new procedures. Copies of these reports are maintained on file at the project locations. Additionally, copies will be forwarded to the program COM.

The JVIII Safety Manager or his designated representative will periodically conduct site visits and perform Site Safety Assessments. These reports are kept on file and are tracked in a database for each -Project Manager and Supervisor/ Superintendent, including the number of action items noted during the visit and written confirmation of the corrective actions for each item. These responses are compiled and provided to program management for review.

JVIII does not anticipate, but may consider the use of, outside sources to provide safety inspections on an as-necessary basis.

As required, JVIII safety equipment will comply with appropriate OSHA, National Institute for Occupational Safety and Health (NIOSH), American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), and U.S. Coast Guard or other recognized certification organizations.

## 8.0 Safety and Health Expectations, Incentive Programs, and Compliance

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### 8.1 Company Safety Program Goals

JVIII considers safety the highest priority during work at all project sites and its business offices and has established a goal of **zero incidents**. All projects will be conducted in a manner which minimizes the probability of near misses, equipment/property damage or injury. JVIII will establish programs to recognize people and projects that demonstrate excellence in safety performance. JVIII will use safety observation programs to identify and correct unsafe acts and conditions. Safety awareness programs will be used to provide continuous training and development of good safety practices. JVIII site supervision will investigate all incidents to determine root causes and institute corrective actions to prevent recurrence. JVIII will provide and enforce safety rules to protect employees, subcontractors, clients and the public. Project managers and superintendents that demonstrate superior safety performance will be rewarded.

### 8.2 JVIII Employee Safety Responsibility Requirements

Each employee is responsible for personal safety as well as the safety of others in the area and is expected to participate fully in the *Safety Improvement Process*, particularly the Safety Observation Program. The employee use all equipment provided in a safe and responsible manner as directed by the SHSO. All JVIII personnel will follow the policies set forth in the JVIII Health and Safety Plan. Site personnel concerned with any aspect of health and safety will bring it to the attention of the Project Manager or SHSO. All project personnel have the authority to stop work if it is their judgment serious injury could result from continued activity. The SHSO will be notified immediately if this becomes necessary. To protect the health and safety of all personnel, employees that knowingly disregard safety policies/procedures may be subject to disciplinary actions up to and including termination.

### 8.3 Managers and Supervisors Safety Accountability

It is the duty of the first line supervisor to motivate employees to adhere to JVIII's safety policy in each work situation. A first line supervisor for these purposes is defined as that person designated to give immediate onsite supervision to personnel involved in a task.

All supervisors will have complete knowledge of the safe procedure for all jobs and tasks under their supervision. When in doubt, they will seek assistance prior to initiating a task. This is the only acceptable manner in which to perform the task. If the task cannot be accomplished safely, it will not be attempted.

Supervisors will:

- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works as instructed.
- Allocate sufficient time for the training and coaching of all employees to ensure that everyone knows the correct procedure for safely accomplishing required tasks.
- Prevent new employees from performing any tasks until required training is completed.
- Immediately correct unsafe conditions, which involved JVIII employees or contractors.
- Ensure that the employees are outfitted with and wear personal protective equipment as specified by this APP, site-specific health and safety plan, other JVIII procedures or as directed by the COM, Project Manager, SHSO, or HSM.
- Set a good safety example.
- Obtain the cooperation of employees and contractors.
- Provide a safe work environment for employees and contractors.
- Confirm contractor safety performance records have been verified prior to contract award and monitor contractor performance during operations.
- Report all accidents, near misses and property damage in accordance with the Incident Management and Reporting Procedure.
- Establish a safety culture, using the elements of the JVIII Safety Improvement process, which promotes awareness, encourages participation and recognizes excellence.

## 9.0 Accident Reporting

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### 9.1 Exposure Data (Man-hours Worked)

The JVIII COM with assistance from the JVIII designated responsible partner tracks and maintains incident records as to Federal reporting requirements (OSHA 300 Log). Incident Rates and Workers Compensation losses are tracked for each Project.

### 9.2 Accident Investigations, Reports, and Logs

The Site Safety Office conducts accident/incident investigations. A report is completed by the SHSO and is required to be reviewed and signed by the Project Manager. The report must be submitted to the COM within 24 hours.

### 9.3 Immediate Notification of Major Incidents

JVIII will immediately notify the Resident Officer in Charge of Construction (ROICC) of any major incident, including injury, fire, equipment/ property damage and environmental incident. A full report will be provided within 48 hours. Procedures to be followed in response to any major personal injury are detailed in the Site Specific Health and Safety Plan, Section 10.3, Response.

# 10.0 Medical Support

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On-site Medical Support/Off-site Medical Arrangements are provided in Section 10.0 of the HSP. Emergency phone numbers are listed in Attachment 4 of the HSP.

# 11.0 Personal Protective Equipment

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Hazard Assessment Procedures/Written Certifications for Personal Protective Equipment Protection levels provided in the HASP have been established for the anticipated scope of work once on-site, results of air monitoring and visual inspection of the work activities may indicate the need for changes in these PPE level(s). Any significant change in the PPE level will be approved by the SHSO in consultation with the Project Manager, HSM and/or COM. Personal Protective Equipment (PPE) selection criteria are outlined in the HSP, Section 5.0, Protective Equipment.

All personnel using respiratory protection shall first be cleared by a physician for use of a respirator and shall be fit-tested to ensure they can achieve an acceptable fit.



# 12.0 Plans Required by the Safety Manual

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## 12.1 Hazard Communication Program

The Site-Specific Hazard Communication Program is included Attachment 2 of the HSP. JVIII Hazard Communication Program complies with 29 CFR 1926.59/1910.1200.

## 12.2 Emergency Response Plans

The Site-Specific Emergency Response and Contingency Plan is included in Section 10.0 of the HSP.

## 12.3 Layout Plans

Site delineation including work zones and sketches are included with the Work Plan. This plan may be modified upon release of the Project Specification.

## 12.4 Respiratory Protection Plan

The primary objective of respiratory protection is to prevent employee exposure to atmospheric contamination. When engineering measures to control contamination are not feasible, or while they are being implemented, personal respiratory protective devices will be used.

The criteria for determining respirator need have been evaluated based on the site contaminants; expected levels of protection are outlined in Section 5.1. Air monitoring will be conducted to confirm that respiratory protection levels are adequate (see Section 7.0 HSP). All respirator users will be OSHA trained in proper respirator use and maintenance. The SHSO and crew leaders will observe workers during respirator use for signs of stress. The SHSO, Project Manager, HSM, and COM will also evaluate the implementation of the HASP, periodically, to determine its continued effectiveness with regard to respiratory protection. All persons assigned to use respirators will have medical clearance to do so.

## 12.5 Lead Abatement Plan

Not Applicable.

## 12.6 Asbestos Abatement Plan

Not Applicable.

## 12.7 Abrasive Blasting

Not Applicable.

## 12.8 Confined Space

The following requirements must be met prior to confined space entry:

- Confined space entrants, attendants, and entry supervisors must complete designated Confined Space Entry training.
- A Confined Space Entry Permit (CSEP), Alternative Procedure Certificate (APC), or Nonpermit Certificate (NPC) must be completed and posted near the space entrance point for review.
- Each confined space entrant and attendant must attend a preentry briefing conducted by the entry supervisor.
- Each confined space entrant and attendant must verify that the entry supervisor has authorized entry and that all permit or certificate requirements have been satisfied.
- Only individuals listed on the Authorization/Accountability Log are permitted to enter the space.
- Each confined space entrant and attendant must verify that atmospheric monitoring has been conducted at the frequency specified on the permit or certificate and that monitoring results are documented and within acceptable safe levels.

The following requirements must be met during confined space entry:

- Communication must be maintained between the attendant and entrants to enable the attendant to monitor entrant status.
- Entrants must use equipment specified on the permit or certificate accordingly.
- All permit or certificate requirements must be followed.
- Entrants must evacuate the space upon orders of the attendant or entry supervisor, when an alarm is sounded, or when a prohibited condition or dangerous situation is recognized.
- Entrants and attendants must inform the entry supervisor of any hazards confronted or created in the space or any problems encountered during entry.

## 12.9 Hazardous Energy Control Plan

This program establishes lockout practices of energy sources that could cause injury to personnel involved at the work site. The lockout program covers all employees and outside contractors affected by the cleaning, repairing, servicing and adjusting of prime movers, machinery, and equipment. Only authorized employees will perform such work.

- Authorized employees will be instructed in lockout/tagout procedures by their supervisor. Each new or transferred employee will be instructed by the supervisor in lockout procedures. A sufficient number of tags and padlocks will be supplied. During each phase of construction, a representative from JVIII will be present while the electrical supervisor begins the lock out/tag out process.
- All equipment will be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy-isolating device bearing a lock.
- Documented periodic inspections will be made periodically by supervisors to ensure that each procedure is being properly followed. The SHSO will ensure these inspections are being performed and keep on record the inspection reports on the job site. The inspection must include a review addressing the employee's responsibilities. Documentation is to include the date of the inspection, equipment on which the procedure was being utilized, the employees involved, and the person performing the inspection.
- Authorized employees will be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source may be involved. Any questionable identification of sources will be cleared through the supervisors.
- To begin the lockout process, use the following items as a guide. If for any reason the following items are in question, contact your immediate supervisor before moving forward. If more than one individual is required to lock out equipment, each person will place his own personal lock on the energy isolating device(s). One authorized individual and a competent person from the prime contractor (JVIII) with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it is the responsibility of the individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the authorized individual will not remove a crew lock until it has been verified that all individuals are clear and a prime contractor competent person is present.
  - Notify all affected employees that a lockout is required.
  - If the equipment is operating, shut it down by the normal stopping procedure.
  - Operate the switch, valve, or other energy isolating devices so that the energy source(s) is disconnected or isolated from the equipment.
  - Stored energy, such as capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
  - Lockout energy isolating devices with an assigned individual lock. A second lock will be used if possible by the superintendent.
  - After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to

make certain the equipment will not operate. CAUTION: Return operating controls to the neutral position after the test.

- Attach a completed accident prevention tag and/or sign on the controls of the machine. The identification tag and/or sign will be coordinated with the electrical contractor and the prime contractor. A JVIII representative will then make known to the facility personnel affected by this operation to familiarize them with the identification of these tags or signs and the procedures in which the contractors will be working by, and the point of contact of the electrical supervisor.
  - The equipment is now locked out.
- To restore equipment to service, use the following items as a guide. If for any reason the following items are in question, contact your immediate supervisor before moving forward.
  - When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed.
  - When equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to the equipment. There must be a supervisor from the electrical contractor and the prime contractor present.
- The following checklist for lockout training is a minimum requirement to provide to new employees. The supervisors must sign, date, and retain in their own records this information. The supervisor must also delivery a copy of this training to the Site Safety Officer.
  - Explain the significance of why a machine is locked or tagged out.
  - Explain what an employee is to do (and not do) when encountering a tag or lock on a switch or device they want to operate.
  - Explain the importance of notification of affected employees.
  - Show the employee the location of all locks, tags, and lockout devices.
  - Explain how to recognize the applicable hazardous energy sources.
  - Explain the type(s) and magnitude of energy to be isolated on the machinery and how to control that energy.
  - Explain the proper sequence of locking out.
- All utility outages will follow the contract specifications, EM 385-1-1 and OSHA standards. The contractors will follow the above information as well as the following:
  - The contractor will supply the required tags and/or locks for each utility outage.
  - PWC Utility outages will be conducted with PWC Utilities, ROICC, the Contractor and sub-contractor.

- Interior building/ facility utility outages will be coordinated with Facility Manager, ROICC, the Contractor and sub-contractor.
- A preparatory meeting will be held prior to all electrical work and utility outages, this meeting will also cover any safety issues that may pertain to the scope of work. The Activity Hazard Analysis will be reviewed and any additional concerns will be annotated on this form.

## **12.10 Critical Lift Procedures**

Not Applicable.

## **12.11 Contingency Plan for Severe Weather**

Contingency plans for severe weather are included in Section 8.0 and Appendix C. of the HSP, Hurricane Preparedness Plan.

## **12.12 Access and Haul Road Plan**

Site delineation, sketches, and traffic control are found in attachment 10 of the HSP

## **12.13 Demolition Plan**

Not applicable.

## **12.14 Emergency Rescue (Tunneling)**

Not Applicable.

## **12.15 Underground Construction Fire Prevention and Protection Plan**

Not Applicable

## **12.16 Compressed Air Plan**

Not Applicable

## **12.17 Form Work and Shoring Erection and Removal Plans**

Not Applicable

## **12.18 Lift Slab Plans**

Not Applicable

## **12.19 Health and Safety Plan**

The JVIII Site Specific Health and Safety Plan is included with this submission.

## **12.20 Blasting Plan**

Not Applicable

## **12.21 Diving Plan**

Not Applicable

## **12.22 Alcohol and Drug Abuse Prevention Plan**

JVIII substance abuse procedures are on file.

# 13.0 Contractor Information to Meet the Requirements of the Major Sections of EM-385-1-1

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In addition to this Accident Prevention Plan, JVIII has prepared a Site-Specific Health and Safety Plan to meet the major requirements of USACE Manual 385-1-1.

## Appendix E

# Erosion and Sediment Control Plan

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# Erosion and Sediment Control Plan

## Site 6 (Fence Area)

Naval Support Facility, Indian Head  
Indian Head, Maryland

Task Order—0005

for  
Naval Facilities Engineering Command  
Washington

Under the  
AGVIQ/CH2M HILL Joint Venture III Program  
Contract # N40080-07-D-0301

Prepared by



Chantilly, Virginia

November 2007

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed registered professional engineer under the laws of the State of Maryland, License No. 13553, Expiration Date 02-31-2009

*Edward R. Underwood*  
*December 4, 2007*



# Contents

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Introduction.....	1
Facility Location and Description .....	1
Site Location and Description.....	1
Topography, Soil Type, and Surface Water Runoff.....	1
Site Activities.....	2
Erosion and Sediment Controls.....	2
Structural Practices.....	3
Vegetative Practices.....	4

## Attachment A – Erosion and Sediment Control Plan Drawings

Sheet G-1	Cover Sheet/Index
Sheet G-2	Abbreviations and Legend
Sheet G-3	Erosion and Sediment Control Notes
Sheet G-4	Vegetation Stabilization Methods and Materials
Sheet G-5	Topsoil Methods and Materials
Sheet G-6	Erosion Control Maintenance Schedule and As Built Certification
Sheet C-1	Erosion and Sediment Control Plan
Sheet SD-1	Details

## Attachment B – Erosion and Sediment Control Calculations

## Attachment C – Soil Map

## Introduction

AGVIQ-CH2M HILL Joint Venture III (JV III) has been contracted by the United States Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Washington to provide environmental remediation services at Site 6, at Naval Support Facility, Indian Head (NSF-IH), Charles County, Maryland. This work is being conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and Executive Order 12580.

This Erosion and Sediment Control Plan (ESCP) has been prepared in accordance with the *Maryland Erosion and Sediment Control Guidelines for State and Federal Projects* [Maryland Department of the Environment (MDE) Water Management Administration (WMA), 2004] to develop practices and procedures to be implemented to control the adverse impacts associated with soil erosion and sedimentation during environmental remediation construction activities.

This ESCP includes erosion and sediment control drawings (Attachment A) and calculations (Attachment B).

## Facility Location and Description

NSF-IH is a Navy facility located in northwestern Charles County, Maryland, approximately 25 miles south of Washington, DC. Indian Head began in 1890 as a Naval gun testing facility and evolved into a critical resource serving the armed forces with specialized ordnance devices and components. The facility consists of two tracts of land: the main area on Cornwallis Neck Peninsula and the Stump Neck Annex on Stump Neck Peninsula located across Mattawoman Creek from the main area. The main area is approximately 2,500 acres and is bounded by the Potomac River to the northwest, west and south; Mattawoman Creek to the south and east; and the town of Indian Head to the northeast.

## Site Location and Description

The site, located near the southern tip of the Cornwallis Neck Peninsula, consists of consists of the areas around Building 1349 (the former control building, currently used for storage), Building 1718 (the current control building), and Building 1140 (the radiographic accelerator building). The Site 6 area for remediation is approximately 0.30 acres (within the fenced area).

## Topography, Soil Type, and Surface Water Runoff

The topography at Site 6 is characterized to the north by a relatively steep hill on which Building 1350 and 1140 are located. Site elevations within the remediation area range from a low point of approximately 16.5 feet to a high point of 27.0 feet. The area from the relatively steep hill to the south is moderately sloped. Based on site topography, surface water runoff flows down the relatively steep hill and moderately sloped hill into a drainage ditch along the southern portion of Site 6. This ditch runs through the middle of the proposed remedial work area. The drainage ditch extends south of Building 1718 to a low area in the southwest corner of the site where water tends to pond. In addition to the ditch



discharging into this low area, stormwater from offsite is carried by a culvert that crosses the access road and discharges into this low area. This low area flows into the southern ditch, which extends in an eastward direction from the low area to the fence line in a well defined ditch. The ditch continues off-site into an undeveloped wooded area before ultimately discharging into the Mattawoman Creek in approximately 750 feet.

Soil underlying the site, as determined from boring logs for the three monitoring wells installed during the remedial investigation (RI) phase consists of light brown to grey silty clay to clay at the near surface. The clay is underlain by sand or sand with silt, which may be interbedded with clay.

The water table, as determined from the monitoring wells installed at the site, ranges in elevation from about 17 feet to 13.9 feet. Based on these elevations, groundwater flows to the east-which is consistent with the expected shallow groundwater flow toward surface drainage to the east - and then southward into the Mattawoman Creek.

## Site Activities

Site remediation activities will include excavation and legal disposal of approximately 323 cubic yards of sliver-contaminated surface soil and subsurface soil. The total excavation area will be approximately 8,500 square feet to an average depth of 1 foot. Two specific areas identified in the work plan will be excavated to a depth of 4 feet. A preliminary soil characterization test will be performed prior to mass excavation. Samples from one bucket of a rubber-tire back-hoe taken from 8 different locations will be combined into a homogenous sample and temporarily stored within a material handling area to allow for laboratory testing. Laboratory analyses will be used to determine the proper disposal facility. The upstream undisturbed drainage area will be temporarily blocked and pumped around the remediation area. The site will then be excavated of all earth material which will be transported and disposed of offsite. No additional testing is required. The excavated area will be backfilled with imported clean fill, seeded, and restored to original conditions. The existing ditch will be re-graded and lined with ECM and rip-rap, as shown on Sheet C-1. 40 feet of the existing culvert under the access road will be removed and replaced.

## Erosion and Sediment Controls

Appropriate erosion and sediment controls, shown on Sheet C-1, will be installed before and throughout the various phases of the remediation activities. A detailed sequence of construction is included on Sheet G-3. Temporary erosion and sediment controls will consist of a stabilized construction entrance, temporarily pumping the upstream undisturbed area around the remediation area, dewatering through a portable sediment tank, check dam, temporary earth dike, clear water diversion fence, and temporary erosion control matting (ECM). Permanent controls will consist of vegetation and an ECM and rip-rap lined ditch. All erosion and sediment controls will be established, inspected, and maintained in accordance with the 1994 *Maryland Standards and Specifications for Soil Erosion and Sediment Control* (MDE, 1994).

Storm water runoff was evaluated for the site to determine the appropriate controls. Engineering design criteria for the earth dikes and rip-rap lined ditch are provided as Attachment B.

## **Structural Practices**

### **Stabilized Construction Entrance**

A stabilized construction entrance will be installed off Deer Point Court to accommodate the ingress and egress of construction traffic. The stabilized construction entrance will be constructed as specified in Detail 5 on Sheet SD-1 with a width of 20 ft to allow for two-way traffic. Inspections will be performed daily and maintenance performed when necessary. All sediment spilled, dropped, or tracked onto public rights-of-way will be removed immediately. If necessary, wheels shall be cleaned to remove sediment. Once construction is complete and the site is stabilized, the stabilized construction entrance will be removed.

### **Temporary Pump Around System**

A temporary pump around system will be installed to pump the upstream undisturbed area around the remediation area. The temporary pump around system will be constructed as specified in Detail 6 on Sheet SD-1 and as shown on Sheet C-1. The pump utilized in the pump around system must be capable of pumping 3.4 cfs at 2.5 feet of total dynamic head with a minimum of 2 inch pipe. If the excavation area remains open and a rainfall event is predicted, the contractor shall maintain a 24 hour presence to ensure the temporary pump around practice is operating properly.

### **Temporary Filter Bag**

Dewatering of the material handling area and the excavation area will be pumped through a temporary filter bag to filter sediment laden surface water runoff from disturbed areas. The outlet of the filter bag will be discharged downstream of the remediation work area and onto undisturbed areas. The temporary filter bag, if used, will be installed as specified in Detail 3 on Sheet SD-1.

### **Check Dams**

A check dam will be installed at the low point of the remediation area to filter sediment laden surface water runoff from the disturbed area. Although typically placed for velocity dissipation, the check dams shall act as a filter medium should any surface water not be pumped through the temporary filter bag during a flash rainfall event. The check dam will be installed as specified in Detail 2 on Sheet SD-1. Inspection and maintenance will be conducted periodically and after each significant rain event. Accumulated sediment will be removed when it has reached half of the original height of the weir crest.

### **ECM and Rip-Rap Lined Ditch**

The existing ditch will be re-graded and lined with ECM and rip-rap, as shown on Sheet C-1, to act as a permanent erosion control measure. Re-grading of the ditch will occur after all excavated earth material is removed and the ditch is backfilled with clean fill as directed by the sequence of construction (G-3). The ECM lined portion of the ditch will be constructed



as specified in Detail 1 on Sheet C-1 and in accordance with Detail 6 on Sheet SD-1. The rip-rap lined portion of the ditch will be constructed as specified in Detail 2 on Sheet C-1.

### **Earth Dike and Clear Water Diversion Fence**

A temporary earth dike and a clear water diversion fence will be installed prior to excavation activities as shown on Sheet C-1. The earth dike will be located on the north side of the remediation area and a clear water diversion fence will be utilized along the south side due to the existing vegetated area. Both the earth dike and diversion fence will be installed prior to clearing and grubbing as directed by the sequence of construction (Sheet G-3) and will direct runoff from undisturbed areas from entering the excavation. The dike will be lined with temporary erosion control matting (ECM) prior to discharging back into the existing ditch. The earth dike will be constructed as specified in Detail 1 on Sheet SD-1 and will be stabilized within 7 days of installation in accordance with the specified vegetative practices (Sheet G-4). The diversion fence will be constructed as specified in Detail 8 on Sheet SD-1. Inspection and maintenance will be conducted periodically and after each rain event. Both the dike and the diversion fence shall remain in place until excavation is complete and all disturbed areas are permanently stabilized.

### **Vegetative Practices**

Temporary and permanent vegetative stabilization will be completed according to the methods and materials described on Sheet G-4. Temporary stabilization of the earth dikes will be completed within 7 days of installation and stabilization will be completed within 14 days of installation of the ford. The temporary seeding summary is provided on Sheet G-4.

Permanent stabilization requirements will be met by the application of permanent seed mixtures of native species as shown on the seeding summary provided on Sheet G-4.

Seed mixes indicated on the plans were taken from Charles County Soil Conservation District's plan submittal guidelines dated 2006.

**Attachment A**  
**Erosion and Sediment Control Plan Drawings**

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EROSION AND SEDIMENT CONTROL PLAN  
FOR  
SITE 6 REMOVAL ACTION  
(FENCED AREA)

NAVAL SUPPORT FACILITY, INDIAN HEAD  
INDIAN HEAD, MARYLAND

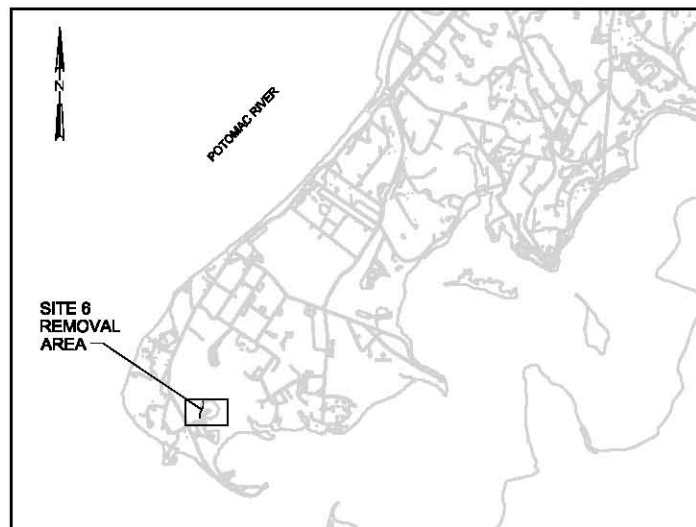


REGIONAL MAP  
TO SCALE

SHEET INDEX

DRAWING NUMBER	TITLE
G-1	COVER SHEET / INDEX
G-2	ABBREVIATIONS AND LEGEND
G-3	EROSION AND SEDIMENT CONTROL NOTES
G-4	VEGETATION STABILIZATION METHODS AND MATERIALS
G-5	TOPSOIL METHODS AND MATERIALS
G-6	EROSION CONTROL MAINTENANCE SCHEDULE AND AS BUILT CERTIFICATION
C-1	EROSION AND SEDIMENT CONTROL PLAN
SD-1	DETAILS

NAVFAC NUMBER
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX



LOCATION MAP  
NOT TO SCALE

GENERAL NOTES:

- THE SCOPE OF WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
  - MOBILIZATION AND DEMOBILIZATION
  - SITE PREPARATION AND CLEARING
  - EXCAVATION OF SOIL AND SEDIMENT
  - OFF-SITE DISPOSAL OF EXCAVATED MATERIALS
  - SITE RESTORATION
  - INCIDENTAL RELATED WORK
- RESTORE SITE TO ITS ORIGINAL CONDITION UNLESS OTHERWISE NOTED, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND/OR AS DIRECTED BY THE ROICC NAVAL TECHNICAL REPRESENTATIVE.
- ALL STATIONING AND DISTANCES SHOWN ON THE DRAWINGS ARE BASED ON HORIZONTAL MEASUREMENTS.
- TOPOGRAPHY WITHIN SITE 6 BOUNDARY PROVIDED BY THE GOVERNMENT.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed registered professional engineer under the laws of the State of Maryland, License No. 13553, Expiration Date 07-31-2009



CH2MHILL

COVER SHEET/INDEX

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE  
PROJ  
DWG  
SHEET

G-1

1 OF 8

FILENAME: \$FILENAME PLOT DATE: \$PLOTDATE PLOT TIME: \$PLOTTIME



1

2

3

4

5

6

ABBREVIATIONS

APPROX

AC

BLDG

CFS

DIA

ECM

FT

HDPE

IN

LB

LLDPE

MAX

MD

MIN

N

NAVFAC

NO.

NTS

OC

%

PLS

RO/CG

SF

SPECS

STD

TBD

TDH

WCFM

#

APPROXIMATE

ACRE

BUILDING

CUBIC FEET PER SECOND

DIAMETER

EROSION CONTROL MATTING

FEET

HIGH DENSITY POLYETHYLENE

INCHES

POUND

LINEAR LOW DENSITY POLYETHYLENE

MAXIMUM

MARYLAND

MINIMUM

NORTH

NAVAL FACILITIES ENGINEERING COMMAND

NUMBER

NOT TO SCALE

ON CENTER

PERCENT

PURE LIVE SEED

RESIDENT OFFICER IN CHARGE OF CONSTRUCTION

SILT FENCE

SPECIFICATIONS

STANDARD

TO BE DETERMINED

TOTAL DYNAMIC HEAD

WOOD CELLULOSE FIBER MULCH

NUMBER, POUND

CIVIL LEGEND

EXISTING

SYMBOL

LEGEND

10

1718

CONTOUR

TREE

TREE/SHRUB LINE

FENCE

DITCH

CULVERT

BUILDING

NEW

SYMBOL

LEGEND

1

C-2

SD-1

LIMITS OF EXCAVATION

LIMITS OF DISTURBANCE

RIPRAP LINED DITCH

ECM LINED DITCH

DETAIL AND SECTION DESIGNATION

NUMBER INDICATES SECTION

SHEET NUMBER WHERE SECTION OR DETAIL IS TAKEN

LETTER INDICATES DETAIL

SHEET NUMBER WHERE SECTION OR DETAIL IS DRAWN

EROSION AND SEDIMENT CONTROL LEGEND

MARYLAND APPLICABLE STANDARDS

STANDARD SYMBOL

EARTH DIKE

A-#

CLEAR WATER DIVERSION FENCE

CWDF

STABILIZED CONSTRUCTION ENTRANCE

SCE

STONE OUTLET STRUCTURE

TSOS

TEMPORARY FILTER BAG

TEMPORARY FILTER BAG

PUMP W/ SANDBAG DIKE

P

CH2MHILL

ABBREVIATIONS AND LEGEND

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING

DATE

PROJ

DWG

SHEET

APPROVED BY

APVR

BY

APVD

APVD

CHK

LAS

DR

MAS

NO

DATE

NO

DATE

NO

DATE

ISSUED FOR 100% REVIEW

FILENAME: \$FILENAME

PLOT DATE: \$PLOTDATE

PLOT TIME: \$PLOTTIME

1. THE CONTRACTOR SHALL NOTIFY THE WATER MANAGEMENT ADMINISTRATION (WMA) AT (410) 537-3610 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY WMA, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN THE PROJECT REPRESENTATIVE AND A REPRESENTATIVE OF WMA.
2. THE CONTRACTOR MUST NOTIFY WMA IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:
  - A. THE REQUIRED PRE-CONSTRUCTION MEETING.
  - B. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
  - C. DURING THE INSTALLATION OF SEDIMENT BASINS (TO BE CONVERTED INTO PERMANENT STORMWATER MANAGEMENT STRUCTURES) AT THE REQUIRED INSPECTION POINTS (SEE INSPECTION CHECKLIST ON PLAN). NOTIFICATION PRIOR TO COMMENCING CONSTRUCTION OF EACH STEP IS MANDATORY.
  - D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).
  - E. PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.
  - F. PRIOR TO FINAL ACCEPTANCE.
3. THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE AGENCY INSPECTOR OR WMA INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES. MINOR SEDIMENT CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE WMA INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM THE WMA INSPECTOR AND AGENCY INSPECTOR. THE CONTRACTOR MUST OBTAIN PRIOR AGENCY AND WMA AND APPROVAL FOR CHANGES TO THE SEDIMENT CONTROL PLAN AND/OR SEQUENCE OF CONSTRUCTION.
4. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
5. THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIMES AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM THE WMA INSPECTOR AND AGENCY INSPECTOR.
6. ALL SEDIMENT BASINS, TRAP EMBANKMENTS AND SLOPES, PERIMETER DIKES, SWALES AND ALL DISTURBED SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES, AS SOON AS POSSIBLE BUT NO LATER THAN SEVEN (7) CALENDAR DAYS AFTER ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT FOR STABILIZATION MAY BE REDUCED TO THREE (3) DAYS FOR SENSITIVE AREAS).
7. THE CONTRACTOR SHALL APPLY SEED AND ANCHORED STRAW MULCH, OR APPROVED STABILIZATION MEASURES TO ALL DISTURBED AREAS AND STOCKPILES WITHIN FOURTEEN (14) CALENDAR DAYS AFTER STRIPPING AND GRADING ACTIVITIES HAVE CEASED IN THE AREA. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT MAY BE REDUCED TO SEVEN (7) DAYS FOR SENSITIVE AREAS).
8. PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS USING SOD OR AN APPROVED PERMANENT SEED MIXTURE WITH REQUIRED SOIL AMENDMENTS AND AN APPROVED ANCHORED MULCH. WOOD FIBER MULCH MAY ONLY BE USED IN SEEDING SEASON WHERE THE SLOPE DOES NOT EXCEED 10% AND GRADING HAS BEEN DONE TO PROMOTE SHEET FLOW DRAINAGE. AREAS BROUGHT TO FINISHED GRADE DURING THE SEEDING SEASON SHALL BE PERMANENTLY STABILIZED AS SOON AS POSSIBLE, BUT NO LATER THAN FOURTEEN (14) CALENDAR DAYS AFTER ESTABLISHMENT. WHEN PROPERTY IS BROUGHT TO FINISHED GRADE DURING THE MONTHS OF NOVEMBER THROUGH FEBRUARY, AND PERMANENT STABILIZATION IS FOUND TO BE IMPRACTICAL, TEMPORARY SEED AND ANCHORED STRAW MULCH SHALL BE APPLIED TO DISTURBED AREAS. THE FINAL PERMANENT STABILIZATION OF SUCH PROPERTY SHALL BE APPLIED BY MARCH 15 OR EARLIER IF GROUND AND WEATHER CONDITIONS ALLOW.
9. THE SITE'S APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF WMA AND THE AGENCY RESPONSIBLE FOR PROJECT.
10. SURFACE DRAINAGE FLOWS OVER UNSTABILIZED CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER PREVENTING DRAINAGE FLOWS FROM TRAVERSING THE SLOPES OR BY INSTALLING PROTECTIVE DEVICES TO LOWER THE WATER DOWNSLOPE WITHOUT CAUSING EROSION. DIKES SHALL BE INSTALLED AND MAINTAINED AT THE TOP OF CUT OR FILL SLOPES UNTIL THE SLOPE AND DRAINAGE AREA TO IT ARE FULLY STABILIZED, AT WHICH TIME THEY MUST BE REMOVED AND FINAL GRADING DONE TO PROMOTE SHEET FLOW DRAINAGE. PROTECTIVE METHODS MUST BE PROVIDED AT POINTS OF CONCENTRATED FLOW WHERE EROSION IS LIKELY TO OCCUR.
11. PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SOD OR SEED WITH AN APPROVED EROSION CONTROL MATTING, RIPRAP OR BY OTHER APPROVED STABILIZATION MEASURES.
12. TEMPORARY SEDIMENT CONTROL DEVICES MAY BE REMOVED, WITH PERMISSION OF WMA INSPECTOR AND AGENCY INSPECTORS, WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS. STORMWATER MANAGEMENT STRUCTURES USED TEMPORARILY FOR SEDIMENT CONTROL SHALL BE CONVERTED TO THE PERMANENT CONFIGURATION WITHIN THIS TIME PERIOD AS WELL.
13. NO PERMANENT CUT OR FILL SLOPE WITH A GRADIENT STEEPER THAN 3:1 WILL BE PERMITTED IN LAWN MAINTENANCE AREAS. A SLOPE GRADIENT OF UP TO 2:1 WILL BE PERMITTED IN NON-MAINTENANCE AREAS PROVIDED THAT THOSE AREAS ARE INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN WITH A LOW-MAINTENANCE GROUND COVER SPECIFIED FOR PERMANENT STABILIZATION. SLOPE GRADIENTS STEEPER THAN 2:1 WILL NOT BE PERMITTED WITH VEGETATIVE STABILIZATION.

14. FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS TO PREVENT WATER FROM POUNDING FOR MORE THAN TWENTY FOUR (24) HOURS AFTER THE END OF A RAINFALL. DRAINAGE COURSES AND SWALE FLOW AREAS MAY TAKE AS LONG AS FORTY-EIGHT (48) HOURS AFTER THE END OF A RAINFALL TO DRAIN. AREAS DESIGNED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS REQUIREMENT.

15. SEDIMENT TRAPS OR BASINS ARE NOT PERMITTED WITHIN 20 FEET OF A FOUNDATION THAT EXISTS OR IS UNDER CONSTRUCTION. NO STRUCTURE MAY BE CONSTRUCTED WITHIN 20 FEET OF AN ACTIVE SEDIMENT TRAP OR BASIN.

16. THE WMA INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.

17. ALL TRAP DEPTH DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION. ALL TRAPS MUST HAVE A STABLE OUTFALL. ALL TRAPS AND BASINS SHALL HAVE STABLE INFLOW POINTS.

18. VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. REFER TO APPROPRIATE SPECIFICATIONS FOR TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SODDING AND GROUND COVERS.

19. SEDIMENT SHALL BE REMOVED AND THE TRAP OR BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE QUARTER OF THE TOTAL DEPTH OF THE TRAP OR BASIN. TOTAL DEPTH SHALL BE MEASURED FROM THE TRAP OR BASIN BOTTOM TO THE CREST OF THE OUTLET.

20. SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS, BUT NOT WITHIN A FLOODPLAIN, WETLAND OR TREE-SAVE AREA. WHEN PUMPING SEDIMENT LADEN WATER, THE DISCHARGE MUST BE DIRECTED TO A SEDIMENT TRAPPING DEVICE PRIOR TO RELEASE FROM THE SITE. A SUMP PIT MAY BE USED IF SEDIMENT TRAPS THEMSELVES ARE BEING PUMPED OUT.

21. ALL WATER REMOVED FROM EXCAVATED AREAS SHALL BE PASSED THROUGH A WMA APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE FROM THE SITE.

22. SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNATED CONTROLS OR AS DIRECTED BY ENGINEER OR WMA INSPECTOR:

  - "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK.
  - EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
  - TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY, UNLESS:
  - TEMPORARY SILT FENCE SHALL BE PLACED IMMEDIATELY DOWN STREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY.

23. WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE. THE FENCE MUST CONFORM TO LOCAL ORDINANCES AND REGULATIONS. THE DEVELOPER OR OWNER SHALL CHECK WITH LOCAL BUILDING OFFICIALS ON APPLICABLE SAFETY REQUIREMENTS. WHERE SAFETY FENCE IS DEEMED APPROPRIATE AND LOCAL ORDINANCES DO NOT SPECIFY FENCING SIZES AND TYPES, THE FOLLOWING SHALL BE USED AS A MINIMUM STANDARD: THE SAFETY FENCE MUST BE MADE OF WELDED WIRE AND AT LEAST 42 INCHES HIGH, HAVE POSTS SPACED NO FARTHER APART THAN 8 FEET, HAVE MESH OPENINGS NO GREATER THAN 2 INCHES IN WIDTH AND 4 INCHES IN HEIGHT WITH A MINIMUM OF 14 GAUGE WIRE. SAFETY FENCE MUST BE MAINTAINED AND IN GOOD CONDITION AT ALL TIMES.

24. OFF-SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY MUST HAVE PRIOR APPROVAL BY WMA AND OTHER APPLICABLE STATE, FEDERAL AND LOCAL AGENCIES; OTHERWISE APPROVAL MUST BE GRANTED BY THE LOCAL AUTHORITIES. ALL WASTE AND BORROW AREAS OFF-SITE MUST BE PROTECTED BY SEDIMENT CONTROL MEASURES AND STABILIZED.

25. FOR SITES WHERE INFILTRATION DEVICES ARE USED FOR THE CONTROL OF STORMWATER, EXTREME CARE MUST BE TAKEN TO PREVENT RUNOFF FROM UNSTABILIZED AREAS FROM ENTERING THE STRUCTURE DURING CONSTRUCTION. SEDIMENT CONTROL DEVICES PLACED IN INFILTRATION AREAS MUST HAVE BOTTOM ELEVATIONS AT LEAST TWO (2) FEET HIGHER THAN THE FINISH GRADE BOTTOM ELEVATION OF THE INFILTRATION PRACTICE. WHEN CONVERTING A SEDIMENT TRAP TO AN INFILTRATION DEVICE, ALL ACCUMULATED SEDIMENT MUST BE REMOVED AND DISPOSED OF PRIOR TO FINAL GRADING OF INFILTRATION DEVICE.

26. WHEN A STORM DRAIN SYSTEM OUTFALL IS DIRECTED TO A SEDIMENT TRAP OR SEDIMENT BASIN AND THE SYSTEM IS TO BE USED FOR TEMPORARILY CONVEYING SEDIMENT LADEN WATER, ALL STORM DRAIN INLETS IN NON-SUMP AREAS SHALL HAVE TEMPORARY ASPHALT BERMS CONSTRUCTED AT THE TIME OF BASE PAVING TO DIRECT GUTTER FLOW INTO THE INLETS TO AVOID SURCHARGING AND OVERFLOW OF INLETS IN SUMP AREAS.

27. SITE INFORMATION:

TOTAL AREA OF FACILITY	2500	ACRES
TOTAL AREA OF SITE	2.4	ACRES
AREA DISTURBED	0.40	ACRES
AREA TO BE ROOFED OR PAVED	0	ACRES
TOTAL CUT	323	CUBIC YARDS
TOTAL FILL	404	CUBIC YARDS
OFF-SITE WASTE/BORROW AREA LOCATION	TBD	

**OWNER'S/DEVELOPER'S CERTIFICATION:**

"I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT - APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT COMPLIANCE INSPECTORS."

<hr style="border: none; border-top: 1px solid black; margin-bottom: 5px;"/> <b>DATE</b>	<hr style="border: none; border-top: 1px solid black; margin-bottom: 5px;"/> <b>EC/ROICC SIGNATURE</b>
<hr style="border: none; border-top: 1px solid black; margin-top: 10px;"/> <b>CARD NO.</b>	<hr style="border: none; border-top: 1px solid black; margin-top: 10px;"/> <b>PRINTED NAME AND TITLE</b>

<p align="center"><b>DESIGN CERTIFICATION:</b></p> <p><b>"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I &amp; II AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT EROSION CONTROL AND SEDIMENT CONTROL REGULATIONS AND STORMWATER MANAGEMENT REGULATIONS.</b></p>	
<p align="center">DATE</p>	<p align="center">DESIGNER'S SIGNATURE</p>
<p>MD. REGISTRATION NO.</p>	<p align="center">PRINTED NAME</p>

1. PRIOR TO INSTALLING SEDIMENT CONTROL MEASURES OR EXCAVATION, A PRE-CONSTRUCTION MEETING MUST BE CONDUCTED ON SITE WITH THE CONTRACTING OFFICER AND THE MDE (401-537-3510) SEDIMENT CONTROL INSPECTOR (CONTRACTOR SHALL PROVIDE 7 DAYS NOTICE).
2. MOBILIZE PERSONNEL AND EQUIPMENT. PROVIDE SURVEY AND LAYOUT OF THE LIMITS OF DISTURBANCE (LOD). THE LOD MUST BE FIELD MARKED PRIOR TO CLEARING TREES, INSTALLATION OF SEDIMENT CONTROLS OR OTHER LAND DISTURBING ACTIVITIES.
3. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AND MATERIAL HANDLING AREA AND TEMPORARY FILTER BAG. BEGIN PRE-EXCAVATION DISPOSAL CHARACTERIZATION TESTING. PERFORM ONLY LIMITED CLEARING AS NECESSARY FOR INSTALLATION.
4. COMPLETE UTILITY LOCATION ACTIVITIES AND DIG PERMIT THROUGH BASE. PRELIMINARY SURVEYING WILL BE COMPLETED DURING CHARACTERIZATION TESTING.
5. ESTABLISH HORIZONTAL AND VERTICAL CONTROL FOR CONSTRUCTION. STAKE-OUT THE LOCATIONS OF ALL AREAS TO BE EXCAVATED AND OR DISTURBED PRIOR TO ACTUAL WORK.
6. UPON COMPLETION OF CHARACTERIZATION TESTING, INSTALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES INCLUDING EARTH DIKE, SILT FENCE, CLEAR WATER DIVERSION FENCE, EROSION CONTROL MATTING, CHECK DAM, PUMP AROUND SYSTEM AND TEMPORARY FILTER BAG. PERFORM ONLY LIMITED CLEARING AS NECESSARY FOR INSTALLATION OF THESE SEDIMENT CONTROL DEVICES.
7. CONSTRUCT TEMPORARY STOCKPILE, STAGING, AND WASTE AREAS AND PROTECT FROM EROSION AND SEDIMENT TRANSPORT. INSTALL TAPE TO DELINEATE ENVIRONMENTAL EXCLUSION ZONES.
8. ABANDON MONITORING WELLS IN ACCORDANCE WITH COMAR 26.04.04. WORK SHALL BE PERFORMED BY A WELL DRILLER LICENSED BY THE MARYLAND STATE BOARD OF WELL DRILLERS.
9. REMOVE EXISTING CULVERT PIPING AS INDICATED AND TEMPORARY DAM ALL UPSTREAM STORMWATER FLOW FROM UNDISTURBED AREA. INSTALL TEMPORARY PIPING AND PUMP AROUND PROPOSED EXCAVATION AREA. IF THE EXCAVATION AREA REMAINS OPEN AND A RAINFALL EVENT IS PREDICTED, THE CONTRACTOR SHALL MAINTAIN A 24 HOUR PRESENCE TO ENSURE THE TEMPORARY PUMP AROUND PRACTICE IS OPERATING PROPERLY.
10. PERFORM REMAINING SITE CLEARING AND GRUBBING WITHIN THE LIMITS OF CLEARING.
11. EXCAVATE CONTAMINATED SOIL AREA INCLUDING TOPSOIL TO A DEPTH OF 1' UNLESS OTHERWISE INDICATED.
12. DISPOSE OF ALL EXCAVATED MATERIAL OFF-SITE.
13. BACKFILL THE EXCAVATION WITH OFF-SITE BORROW MATERIAL TO EXISTING GRADE AND RE-GRADE THE DISTURBED AREA OF THE SITE. PLACE BACKFILL MATERIAL IN 6" MAXIMUM LIFTS AND COMPACT EACH LIFT TO A MINIMUM OF 85% RELATIVE DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698. GRADE DITCH WITH EROSION CONTROL MATTING AND RIP-RAP PROTECTION AS INDICATED. APPLY SEED IN ACCORDANCE WITH DRAWINGS. AT NO TIME SHALL A DISTURBED AREA BE UPGRADIENT OF A COMPLETE STABILIZED AREA.
14. RE-CONSTRUCT EXISTING DRAINAGE CULVERT TO MATCH EXISTING CONDITIONS. RE-GRADE AND SEED IN ACCORDANCE WITH DRAWINGS.
15. HOLD A FINAL INSPECTION, TO BE ATTENDED BY THE CONTRACTOR, CONTRACTING OFFICER AND MDE INSPECTOR TO DETERMINE PUNCH LIST ITEMS AND DEVELOP A TIMETABLE FOR THE REMOVAL OF THE TEMPORARY SEDIMENT CONTROL MEASURES.
16. CONDUCT A FINAL SURVEY OF THE SITE AND GENERATE AS-BUILT ELEVATIONS FOR ACTIVITIES COMPLETED.
17. REMOVE REMAINING TEMPORARY EROSION AND SEDIMENT CONTROLS MEASURES AFTER RECEIVING WRITTEN APPROVAL FROM MDE INSPECTOR AND CONTRACTING OFFICER. STABILIZE THE REMAINING DISTURBED AREAS.
18. DEMOBILIZE PERSONNEL AND EQUIPMENT WHEN APPROPRIATE.

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN SEVEN (7) CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND FOURTEEN (14) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

**CH2MHILL**

**EROSION AND SEDIMENT  
CONTROL NOTES**

**VERIFY SCALE**

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SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION

- i. INSTALL EROSION AND SEDIMENT CONTROL STRUCTURES (EITHER TEMPORARY OR PERMANENT) SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, WATERWAYS, OR SEDIMENT CONTROL BASINS.
- ii. PERFORM ALL GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. FINAL GRADING AND SHAPING IS NOT USUALLY NECESSARY FOR TEMPORARY SEEDING.
- iii. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES FOR SITES HAVING DISTURBED AREA OVER 5 ACRES.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

- i. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OVER 5 ACRES. SOIL ANALYSIS MAY BE PERFORMED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
- ii. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING, AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS SHALL BE DELIVERED TO THE SITE, FULLY LABELED ACCORDING TO APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK, AND WARRANTY OF THE PRODUCER.
- iii. LIME MATERIALS SHALL BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 50% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SIEVE, AND 98 TO 100% WILL PASS THROUGH A #20 MESH SIEVE.
- iv. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 - 5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C. SEEDBED PREPARATION

I. TEMPORARY SEEDING

- a. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 3 INCHES TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS, CHISEL PLOWS, OR RIPPER MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENEED, IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN THE ROUGHENED CONDITION. SLOPED AREAS (GREATER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
- b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
- c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

ii. PERMANENT SEEDING

- a. MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT:
1. SOIL pH SHALL BE BETWEEN 6.0 AND 7.0.
2. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).
3. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY, BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION IS IF LOVEGRASS OR SERECIA LESPEDEZA IS TO BE PLANTED, THEN A SANDY SOIL (<30% SILT PLUS CLAY) WOULD BE ACCEPTABLE.
4. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.
5. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
6. IF THESE CONDITIONS CANNOT BE MET BY SOILS ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH SECTION 21 "STANDARD AND SPECIFICATION FOR TOPSOIL" OF THE 1994 MD STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
- b. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DRAWINGS SHALL BE MAINTAINED IN A TRUE AND EVEN GRADE, THEN SCARIFIED OR OTHERWISE LOOSENEED TO A DEPTH OF 3 TO 5 INCHES TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREA AND TO CREATE HORIZONTAL EROSION CHECK SLOTS TO PREVENT TOPSOIL FROM SLIDING DOWN A SLOPE.
- c. APPLY SOIL AMENDMENTS AS PER SOIL TEST OR AS INCLUDED IN THE CONTRACT DOCUMENTS.

- d. MIX SOIL AMENDMENTS INTO THE TOP 3 - 5 INCHES OF TOPSOIL BY DISKING OR OTHER SUITABLE MEANS. LAWN AREAS SHALL BE RAKED TO SMOOTH THE SURFACE; REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE. STEEP SLOPES (STEEPER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 - 3 INCHES OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY NOT BE NECESSARY ON NEWLY DISTURBED AREAS.

D. SEED SPECIFICATIONS

- i. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED SHALL BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED SHALL HAVE BEEN TESTED WITHIN 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON THIS JOB.

NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.

- ii. INOCULANT - THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES SHALL BE A PURE CULTURE OF NITROGEN-FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS SHALL NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANT AS DIRECTED ON PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 - 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE INOCULANT LESS EFFECTIVE.

E. METHODS OF SEEDING

- i. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER), BROADCAST OR DROP SEEDER, OR A CULTPACKER SEEDER.
- a. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES AMOUNTS SHALL NOT EXCEED THE FOLLOWING: NITROGEN - MAXIMUM OF 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS): 200 POUNDS/ACRE; K20 (POTASSIUM): 200 POUNDS/ACRE
- b. LIME - USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
- c. SEED AND FERTILIZER SHALL BE MIXED ON SITE, AND SEEDING SHALL BE DONE IMMEDIATELY WITHOUT INTERRUPTION.
- ii. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
- a. SEED SPREAD SHALL BE INCORPORATED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON THE TEMPORARY OR PERMANENT SEEDING SUMMARIES. THE SEEDED AREA SHALL THEN BE ROLLED WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED-TO-SOIL CONTACT.
- b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
- iii. DRILL OR CULTPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
- a. CULTPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
- b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)

- i. STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT, RYE, OR OAT STRAW, REASONABLY BRIGHT IN COLOR, AN SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY AND SHALL BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW.
- ii. WOOD CELLULOSE FIBER MULCH (WCFM)
- a. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
- b. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
- c. WCFM, INCLUDING DYE, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

- d. WCFM MATERIALS SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND THE SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL SHALL FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.
- e. WCFM MATERIAL SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
- f. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH TO APPROXIMATELY 10 MM., DIAMETER APPROXIMATELY 1MM., OH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.8% MAXIMUM AND WATER HOLDING CAPACITY OF 90% MINIMUM.

NOTE: ONLY STERILE STRAW SHOULD BE USED IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

- G. MULCHING SEEDED AREAS - MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.

- i. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH ALONE SHALL BE APPLIED AS PRESCRIBED IN THIS SECTION AND MAINTAINED UNTILL THE SEEDING SEASON RETURNS AND SEEDING CAN BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS.
- ii. WHEN STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS/ACRE. MULCH SHALL BE APPLIED TO A UNIFORM LOOSE DEPTH OF BETWEEN 1" AND 2". MULCH APPLIED SHALL ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHOULD BE INCREASED TO 2.5 TONS/ACRE.
- iii. WOOD CELLULOSE FIBER USED AS A MULCH SHALL BE APPLIED AT A NET DRY WEIGHT OF 1,500 LBS. PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS. OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

- H. SECURING STRAW MULCH (MULCH ANCHORING): MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON SIZE OF AREA AND EROSION HAZARD:

- i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF TWO (2) INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD BE USED ON THE CONTOUR IF POSSIBLE.
- ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 POUNDS/ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
- iii. APPLICATION OF LIQUID BINDERS SHOULD BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINDER OF AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. SYNTHETIC BINDERS - SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TACK II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH.
- iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7a)					FERTILIZER RATE (10-10-10)	LIME RATE
NO.	SPECIES	APPLICATION RATE (lb/1000 SF)	SEEDING DATES	SEEDING DEPTHS (IN)		
1	PERENNIAL RYE	3.22	FEB. 1 - APR. 30 OR AUG. 15 - NOV. 30	1-2	800 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

PERMANENT SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7a)					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (lb/1000 SF)	SEEDING DATES	SEEDING DEPTHS (IN)	N	P205	K20	
1	TALL FESCUE	5-6	MAR. 1 - MAY. 15 OR AUG. 15 - NOV. 15	¼ - ½	92 LB/AC (2.0 LB/ 1000 SF)	175 LB/AC (4 LB/ 1000 SF)	175 LB/AC (1000 SF)	2 TONS/AC (100 LB/ 1000 SF)

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VEGETATION STABILIZATION  
METHODS AND MATERIALS

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**CONSTRUCTION AND MATERIALS SPECIFICATION:**

**I. TOPSOIL SPECIFICATIONS - SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:**

- i. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5% VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½" IN DIAMETER.
- ii. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
- iii. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

**II. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:**

- I. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20/0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS.

### III. TOPSOIL APPLICATION

- i. **WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.**
- ii. **GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4" - 8" HIGHER IN ELEVATION.**
- iii. **TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN 1 4" - 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.**
- iv. **TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.**

IV. ALTERNATIVE FOR PERMANENT SEEDING - INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:

- i. COMPOSTED SLUDGE MATERIAL FOR USE AS A SOIL CONDITION FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
  - A. COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS THAT ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.
  - B. COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 1.5 PERCENT PHOSPHORUS, AND 0.2 PERCENT POTASSIUM AND HAVE A PH OF 7.0 OR 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.
  - C. COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SQUARE FEET.
- ii. COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILIZER APPLIED AT THE RATE OF 4 LB/1,000 SQUARE FEET, AND 1/3 THE NORMAL LIME APPLICATION RATE.

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## TOPSOIL METHODS AND MATERIALS

### VERIFY SCALE

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EROSION CONTROL INSPECTION AND MAINTENANCE:

STABILIZED CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL MINIMIZE TRACKING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE ADDING STONE OR OTHER REPAIRS AS CONDITIONS DEMAND. ALL SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY BY VACUUM SWEEPING, SCRAPING, OR SWEEPING. DAILY MAINTENANCE AND INSPECTION IS REQUIRED.

SILT FENCE AND CLEAR WATER DIVERSION FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE FABRIC HEIGHT.

EARTH DIKES AND TEMPORARY SWALES SHALL BE INSPECTED PERIODICALLY AND AFTER EACH RAIN EVENT AND MAINTAINED AS NECESSARY.

STONE OUTLET STRUCTURE SHALL BE CHECKED PERIODICALLY AND AFTER EACH SIGNIFICANT RAINFALL. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED 1/2 OF THE ORIGINAL HEIGHT OF THE WEIR CREST.

AS BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY SHOWN ON THE PLANS HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, EXCEPT AS NOTED IN RED ON THE "AS BUILT" DRAWINGS.

NAME

SIGNATURE

MARYLAND REGISTRATION NUMBER

DATE

MDE NO.

FACILITY IDENTIFICATION (NUMBER AND/OR TYPE)

\*CERTIFY\* MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.

CH2MHILL

EROSION CONTROL MAINTENANCE  
SCHEDULE AND AS-BUILT CERTIFICATION

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE

PROJ

DWG

SHEET

NO

DATE

REVISION

DESCRIPTION

APVR

BY

APVD

APVD

CHK

LAS

DR

MAS

GMJ

APPROVED BY

ISSUED FOR 100% REVIEW

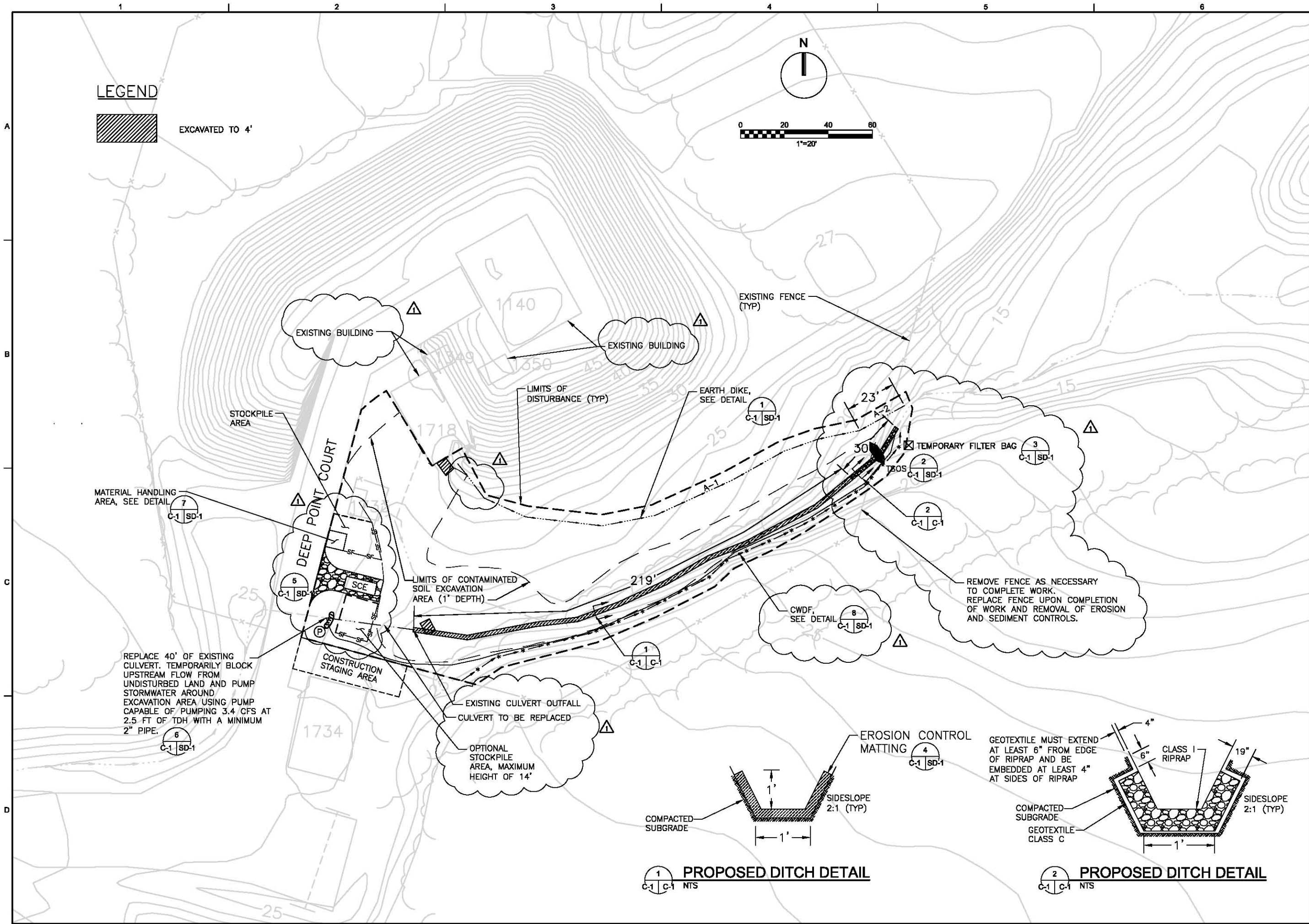
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FILENAME: \$FILENAME

PLOT DATE: \$PLOTDATE

PLOT TIME: \$PLOTTIME





CH2MHILL		EROSION AND SEDIMENT CONTROL PLAN		VERIFY SCALE	
		BAR IS ONE INCH ON ORIGINAL DRAWING.		DATE	
NO		DATE		PROJ	
APVD		BY		DWG	
APVD		BY		SHEET	
APVD		BY		7 OF 8	
APVD		BY		ISSUED FOR 100% REVIEW	
APVD		BY		FILENAME: \$FILENAME	
APVD		BY		PLOT DATE: \$PLOTDATE	
APVD		BY		PLOT TIME: \$PLOTTIME	
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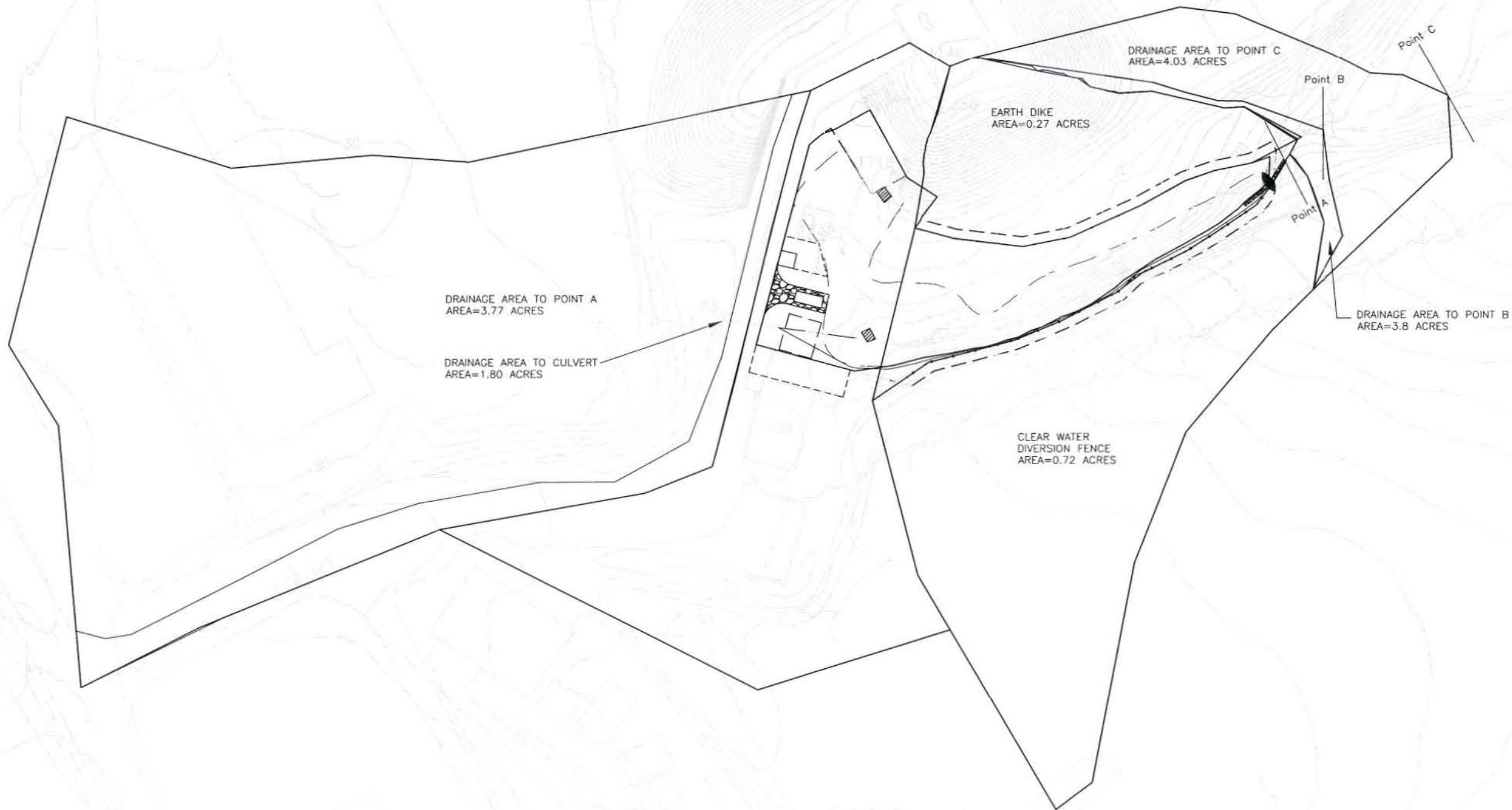
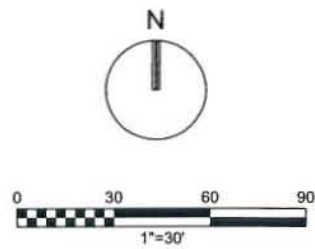




**Attachment B**  
**Erosion and Sediment Control Calculations**

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DRAINAGE AREA MAP

## OUTFALL ADEQUACY NARRATIVE

### GENERAL

Improvements to current storm water drainage measures are provided for the proposed project. The proposed improvements include removing and replacing 40 feet of existing culvert and the addition of 30 feet of riprap to the existing storm water ditch at the fence line to prevent erosion around fence posts. The area of study for outfall adequacy includes from the point at which the riprap ceases (Point A) through two reaches (A-B and B-C), each having defined bed and banks.

### DRAINAGE AREA

The total drainage area for Reach A-B is 3.8 acres, 4.03 acres for Reach B-C.

### OUTFALL DISCHARGE AMOUNT

No development is occurring on this site, peak two-year post-development discharges are equivalent to the peak two-year pre-development discharges. For Reach A-B peak two-year discharge is 6.95 cfs and for Reach B-C peak two-year discharge is 7.37 cfs. All two-year peak releases are contained within the bed and banks for each reach.

### CHANNEL CROSS SECTION

The channel cross section for both reaches is a trapezoidal section. For Reach A-B the bottom width is one foot with a left side slope of 8:1 and a right side slope of 3:1. For Reach B-C the bottom width is one foot with a left side slope of 20:1 and a right side slope of 4:1.

### LIMITS OF STUDY

The limits of study area are as depicted on the drainage divide map.

### CHANNEL PERMISSABLE VELOCITY

As the beds of the reaches are unknown, a Manning's "n-value" of 0.03 was assumed for both reaches.

### CHANNEL CAPACITY

For Reach A-B depth of flow for peak ten-year discharge is 0.58 ft, 0.42 for Reach B-C.

### CHANNEL VELOCITY

Velocities for the peak 2-year discharge range from 3.46 to 3.48 fps.

### EASEMENT REQUIREMENTS

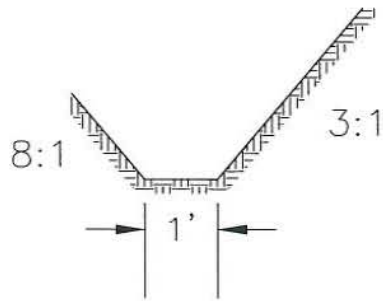
No easements are required since the downstream reaches are proven to be adequate and no channel improvements are proposed.

### DOWNSTREAM IMPACT

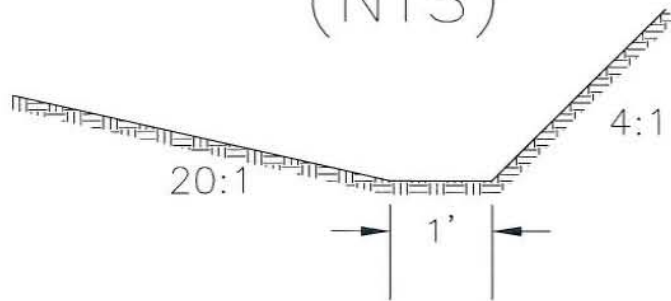
No culverts or bridges are present through the entire limits of study.

### FINAL OPINION

Because the two-year peak discharge is unchanged, it is the opinion of the engineer that the outfall is adequate and will not adversely affect the outfall channel either at, or downstream of, the single point of outfall, Point A.



DITCH CROSS  
SECTION @  
POINT B  
(NTS)



DITCH CROSS  
SECTION @  
POINT C  
(NTS)

FIGURE 1  
DITCH CROSS SECTIONS  
FOR OUTFALL ANALYSIS

DRAINAGE AREA &amp; FLOW @ PT B

$$AREA = 164073 SF + 1522 SF$$

$$= 165595 SF = 3.8 AC$$

$$C = \frac{0.9(0.27) + 0.3(3.53)}{3.8}$$

$$= 0.34$$

$$t_c = 5 \text{ min} \therefore i_2 = 5.38 \text{ "/hr}$$

$$i_{10} = 7 \text{ "/hr}$$

$$Q_2 = C i_2 A$$

$$= 0.34 \cdot 5.38 \text{ "/hr} \cdot 3.8 AC$$

$$= 6.95 \text{ CFS}$$

$$Q_{10} = C i_{10} A$$

$$= 0.34 \cdot 7 \text{ "/hr} \cdot 3.8 AC$$

$$= 9.04 \text{ CFS}$$

DRAINAGE AREA &amp; FLOW @ PTC

$$AREA = 164093 SF + 11546 SF = 4.03 AC$$

$$C = \frac{0.9(0.27) + 0.3(3.76)}{4.03 AC}$$

$$C = 0.34$$

$$t_c = 5 \text{ MIN} \therefore i_2 = 5.38 \text{ "/hr}$$

$$i_{10} = 7 \text{ "/hr}$$

$$Q_2 = C i_2 A$$

$$= 0.34 \cdot 5.38 \text{ "/hr} \cdot 4.03 AC$$

$$= 7.37 \text{ CFS}$$

$$Q_{10} = C i_{10} A$$

$$= 0.34 \cdot 7 \text{ "/hr} \cdot 4.03 AC = 9.59 \text{ CFS}$$



## Worksheet for Reach A-B\_2Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.02500	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	6.95	ft³/s

### Results

Normal Depth	0.52	ft
Flow Area	2.01	ft²
Wetted Perimeter	6.84	ft
Top Width	6.72	ft
Critical Depth	0.55	ft
Critical Slope	0.01978	ft/ft
Velocity	3.46	ft/s
Velocity Head	0.19	ft
Specific Energy	0.71	ft
Froude Number	1.12	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.52	ft
Critical Depth	0.55	ft
Channel Slope	0.02500	ft/ft
Critical Slope	0.01978	ft/ft

## Worksheet for Reach B-C\_2Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.04000	ft/ft
Left Side Slope	20.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	7.37	ft <sup>3</sup> /s

### Results

Normal Depth	0.38	ft
Flow Area	2.12	ft <sup>2</sup>
Wetted Perimeter	10.19	ft
Top Width	10.13	ft
Critical Depth	0.43	ft
Critical Slope	0.02140	ft/ft
Velocity	3.48	ft/s
Velocity Head	0.19	ft
Specific Energy	0.57	ft
Froude Number	1.34	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.38	ft
Critical Depth	0.43	ft
Channel Slope	0.04000	ft/ft
Critical Slope	0.02140	ft/ft

## Worksheet for Reach A-B\_10Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.02500	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	9.04	ft³/s

### Results

Normal Depth	0.58	ft
Flow Area	2.44	ft²
Wetted Perimeter	7.53	ft
Top Width	7.40	ft
Critical Depth	0.62	ft
Critical Slope	0.01909	ft/ft
Velocity	3.70	ft/s
Velocity Head	0.21	ft
Specific Energy	0.79	ft
Froude Number	1.13	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.58	ft
Critical Depth	0.62	ft
Channel Slope	0.02500	ft/ft
Critical Slope	0.01909	ft/ft

## Worksheet for Reach B-C\_10Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.04000	ft/ft
Left Side Slope	20.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	9.59	ft³/s

### Results

Normal Depth	0.42	ft
Flow Area	2.58	ft²
Wetted Perimeter	11.24	ft
Top Width	11.18	ft
Critical Depth	0.48	ft
Critical Slope	0.02066	ft/ft
Velocity	3.72	ft/s
Velocity Head	0.21	ft
Specific Energy	0.64	ft
Froude Number	1.36	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.42	ft
Critical Depth	0.48	ft
Channel Slope	0.04000	ft/ft
Critical Slope	0.02066	ft/ft



## Worksheet 2: Runoff curve number and runoff

Project <b>REMOVAL ACTION</b>	By <b>M. SHINDORF</b>	Date <b>11/2/07</b>
Location <b>NSF-IH (EARTH DIKE #1)</b>	Checked	Date

Check one: ☒ Present ☐ Developed

### 1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description  (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN <sup>1/</sup>			Area  <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
		Table 2-2	Figure 2-3	Figure 2-4		
<b>D</b>	<b>2% IMPERVIOUS</b>	<b>86</b>			<b>0.27</b>	<b>23.22</b>

<sup>1/</sup> Use only one CN source per line

Totals ➡ **0.27** **23.2**

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{23.2}{0.27} = 86 ; \quad \text{Use CN} \rightarrow \boxed{86}$$

### 2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	<b>2</b>		
Rainfall, P (24-hour) ..... in	<b>2</b>		
Runoff, Q ..... in	<b>0.86</b>		
(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)			

## EARTH DIKE #1 (NORTH) ANALYSIS

$$\text{DRAINAGE AREA} = 11754 \text{ SF} = 0.27 \text{ AC}$$

$$\text{IMPERVIOUS AREA} = 242 \text{ SF} = 0.006 \text{ AC}$$

2% IMPERVIOUS

- see attached tables for flow calculation

$$Q = 0.34 \text{ CFS}$$

Velocity (V) of ditch was calculated  
USING HASTEAD'S FLOWMASTER (See  
attached WORKSHEET)

$$\text{ROUGHNESS COEFFICIENT} = 0.030 (\text{ECM})$$

$$S = 0.14 \text{ ft/ft (WORST CASE)}$$

$$V = 4.24 \text{ ft/s}$$

$$4 \text{ ft/s} < V < 6 \text{ ft/s} \therefore \text{USE ECM}$$

## EVALUATE REST OF DITCH

$$\text{ASSUME SAME } Q = 0.34 \text{ CFS}$$

$$\text{ROUGHNESS COEFFICIENT} = 0.025$$

$$S = 0.095 \text{ ft/ft}$$

$$V = 3.52 \text{ ft/s}$$

$$V < 4 \text{ ft/s USE SEED \& MULCH}$$

USE A-1 EARTH DIKE FOR ALL BUT  
THE LAST 6 FEET OF DITCH WHERE  
A-2 EARTH DIKE WILL BEGIN

## Worksheet for Earth Dike #1\_14%\_Slope

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.14000	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Discharge	0.59	ft <sup>3</sup> /s

### Results

Normal Depth	0.24	ft
Flow Area	0.14	ft <sup>2</sup>
Wetted Perimeter	1.27	ft
Top Width	1.18	ft
Critical Depth	0.32	ft
Critical Slope	0.02670	ft/ft
Velocity	4.24	ft/s
Velocity Head	0.28	ft
Specific Energy	0.52	ft
Froude Number	2.18	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.24	ft
Critical Depth	0.32	ft
Channel Slope	0.14000	ft/ft
Critical Slope	0.02670	ft/ft

## Worksheet 4: Graphical Peak Discharge method

Project <u>REMOVAL ACTION</u>	By <u>M. SHINDORF</u>	Date <u>11/2/87</u>
Location <u>NSF- I H (EARTH DIKE #1)</u>	Checked	Date

Check one: ☒ Present ☐ Developed

1. Data

Drainage area .....  $A_m = 0.0004$  mi<sup>2</sup> (acres/640)

Runoff curve number .....  $CN = 86$  (From worksheet 2)

Time of concentration .....  $T_c = 0.08$  hr (From worksheet 3)

Rainfall distribution ..... = II (I, IA, II III)

Pond and swamp areas spread throughout watershed ..... = 0 percent of  $A_m$  (..... acres or mi<sup>2</sup> covered)

	Storm #1	Storm #2	Storm #3
2. Frequency ..... yr	2		
3. Rainfall, P (24-hour) ..... in	2		
4. Initial abstraction, $I_a$ ..... in (Use CN with table 4-1)	0.326		
5. Compute $I_a/P$ .....	0.163		
6. Unit peak discharge, $q_u$ ..... csm/in (Use $T_c$ and $I_a/P$ with exhibit 4- <u>II</u> )	1000		
7. Runoff, Q ..... in (From worksheet 2) Figure 2-6	0.86		
8. Pond and swamp adjustment factor, $F_p$ ..... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)	1.0		
9. Peak discharge, $q_p$ ..... ft <sup>3</sup> /s ( Where $q_p = q_u A_m QF_p$ )	0.34		



## Worksheet for Earth Dike #1

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.025	
Channel Slope	0.09500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Discharge	0.34	ft <sup>3</sup> /s

### Results

Normal Depth	0.18	ft
Flow Area	0.10	ft <sup>2</sup>
Wetted Perimeter	1.14	ft
Top Width	1.08	ft
Critical Depth	0.24	ft
Critical Slope	0.01995	ft/ft
Velocity	3.52	ft/s
Velocity Head	0.19	ft
Specific Energy	0.37	ft
Froude Number	2.07	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.18	ft
Critical Depth	0.24	ft
Channel Slope	0.09500	ft/ft
Critical Slope	0.01995	ft/ft

## Worksheet 2: Runoff curve number and runoff

Project <b>REMOVAL ACTION</b>	By <b>M. SHINDORK</b>	Date <b>11/2/07</b>
Location <b>NSF-IH (EARTH DIKE #2)</b>	Checked	Date

Check one: ☒ Present ☐ Developed

### 1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description  (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN <sup>1/</sup>			Area  <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
		Table 2-2	Figure 2-3	Figure 2-4		
<b>D</b>	<b>0% IMPERVIOUS</b>	<b>86</b>			<b>0.72</b>	<b>61.9</b>

<sup>1/</sup> Use only one CN source per line

Totals ➡ **0.72 61.9**

CN (weighted) =  $\frac{\text{total product}}{\text{total area}}$  = \_\_\_\_\_ = \_\_\_\_\_ ;

Use CN ➡

**86**

### 2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	<b>2</b>		
Rainfall, P (24-hour) ..... in	<b>2</b>		
Runoff, Q ..... in	<b>0.86</b>		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

## Worksheet 2: Runoff curve number and runoff

Project <b>REMOVAL ACTION</b>	By <b>M. SHINDORF</b>	Date <b>11/2/07</b>
Location <b>NSF-IH (EARTH DIKE #2)</b>	Checked	Date

Check one: ☒ Present ☐ Developed

### 1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description  (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN <sup>1/</sup>			Area  <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
		Table 2-2	Figure 2-3	Figure 2-4		
<b>D</b>	<b>0% IMPERVIOUS</b>	<b>86</b>			<b>0.72</b>	<b>61.9</b>

<sup>1/</sup> Use only one CN source per line

Totals ➡

**0.72 61.9**

CN (weighted) =  $\frac{\text{total product}}{\text{total area}}$  = \_\_\_\_\_ = \_\_\_\_\_ ;

Use CN ➡

**86**

### 2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	<b>2</b>		
Rainfall, P (24-hour) ..... in	<b>2</b>		
Runoff, Q ..... in	<b>0.86</b>		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

## Worksheet 4: Graphical Peak Discharge method

Project <u>REMOVAL ACTION</u>	By <u>M SHINDLER</u>	Date <u>11/2/07</u>
Location <u>NSF-14 (EARTH DIKE #2)</u>	Checked	Date

Check one: ☒ Present   ☐ Developed

1. Data

Drainage area .....  $A_m = \underline{0.0011}$  mi<sup>2</sup> (acres/640)

Runoff curve number ..... CN = 86 (From worksheet 2)

Time of concentration .....  $T_c = \underline{0.08}$  hr (From worksheet 3)

Rainfall distribution ..... = II (I, IA, II III)

Pond and swamp areas spread throughout watershed ..... = 0 percent of  $A_m$  (..... acres or mi<sup>2</sup> covered)

	Storm #1	Storm #2	Storm #3
2. Frequency ..... yr	<u>2</u>		
3. Rainfall, P (24-hour) ..... in	<u>2</u>		
4. Initial abstraction, $I_a$ ..... in (Use CN with table 4-1)	<u>0.320</u>		
5. Compute $I_a/P$ .....	<u>0.163</u>		
6. Unit peak discharge, $q_u$ ..... csm/in (Use $T_c$ and $I_a/P$ with exhibit 4- <u>II</u> )	<u>1000</u>		
7. Runoff, Q ..... in (From worksheet 2) Figure 2-6	<u>0.86</u>		
8. Pond and swamp adjustment factor, $F_p$ ..... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)	<u>1.0</u>		
9. Peak discharge, $q_p$ ..... ft <sup>3</sup> /s (Where $q_p = q_u A_m QF_p$ )	<u>0.95</u>		



## 1.0 STANDARDS AND SPECIFICATIONS

### FOR

### EARTH DIKES

#### Definition

A temporary berm or ridge of soil, compacted, stabilized and located in such a manner as to direct water to a desired location.

#### Purpose

The purpose of the earth dike is to direct runoff to a sediment trapping device which reduces the potential for erosion and sedimentation. Earth dikes can also be used for diverting clean water away from disturbed areas.

#### Conditions Where Practice Applies

Earth dikes are often constructed across disturbed areas and around construction sites such as parking lots and subdivisions. The dikes shall remain in place until the disturbed areas are permanently stabilized.

Earth Dikes are constructed:

1. To divert sediment laden runoff from a disturbed area to a sediment trapping device.
2. Across disturbed areas to shorten overland flow distances.
3. To direct sediment laden water along the base of slopes to a trapping device.
4. To divert clear water from an undisturbed area to a stabilized outlet. Runoff shall be discharged at non-erosive rates.

Table 1 Design Criteria

	<u>Dike A</u>	<u>Dike B</u>
Drainage Area	(See Table 2)	(See Table 2)
Slope (of dike)	(See Table 2)	(See Table 2)
Dike Height (a)	18 in.	30 in.
Dike Width (b)	24 in.	36 in.
Flow Width (c)	4 ft.	6 ft.
Flow Depth in Channel (d)	12 in.	24 in.
Side Slopes	2 : 1 or flatter	2 : 1 or flatter

Note: 1. For slopes or drainage areas other than specified on Table 2, an engineering design is required. If the slope of the earth dike or the drainage area contributing to the dike falls between values on Table 2, round up to the next higher slope or drainage area.

2. Stabilization of the earth dike shall be completed within seven days of installation.

#### Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Earth dikes having longitudinal slopes flatter than 1% should have spot elevations along the flow line.

2. Diverted runoff from disturbed areas shall be directed to a sediment trapping devices.

3. Diverted runoff from undisturbed areas shall outlet directly onto an undisturbed, stabilized area at a non-erosive velocity ( $\leq 4$  fps for grass).

4. All trees, brush, stumps, and obstructions shall be removed and disposed of so as not to interfere with the proper functioning of the earth dike berm and flow channel.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the earth dike berm and flow channel.

8. Inspection and maintenance must be provided periodically and after each rain event.

#### Stabilization

Stabilization of the earth dike shall be completed within 7 days of installation in accordance with the standards and specifications for Vegetative Practices (Section G). The earth dike flow channel shall be stabilized in accordance with Table 2, and the following criteria:

### Flow Channel Stabilization

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil in a minimum 7" layer.

The earth dike type (A or B) and lining (1, 2, or 3) shall be shown on the plans using the standard symbol and A-1, or B-3, etc. Earth dike type and lining may vary along its length.

In highly erodible soils, as defined by the local approval agency, refer to the next higher slope grade for the type of stabilization needed.

### Engineering Design Criteria

Engineering design may preempt the use of Table 2. The basis for the engineering design shall be the 2-year frequency storm using SCS criteria, assuming the worst soil cover conditions to prevail in the contributing drainage area over the life of the earth dike. Manning's Equation shall be used to determine earth dike flow channel velocities associated with the developed discharges. The Manning's Roughness coefficients to be used in the equation are 0.025 for seed and mulch, 0.03 for soil stabilization matting or sod, and for 4" - 7" stone use 0.045 for flow depths up to 1 foot (Dike A) and 0.038 for flow depths between 1 and 2 feet (Dike B). The allowable flow channel velocities shall be < 4 fps for Seed and Mulch, < 6 fps for Stabilization Matting or sod, and < 8 fps for 4" - 7" stone.

### Outlet

1. Earth dikes must have an outlet that functions without causing erosion.
2. Runoff from disturbed areas shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin until the drainage area above the earth dike is adequately stabilized.
3. The on-site location may need to be adjusted to meet field conditions.
4. Clear water diversions around disturbed areas shall be discharged into an undisturbed, stabilized area or watercourse at a non erosive velocity.

### Removal

Following completion of all construction and stabilization at a site with established vegetation, all temporary earth dikes shall be removed and the areas occupied by the dikes shall be graded and stabilized with vegetation.

### Directions for Using Table 2

1. Determine the location on the Erosion and Sediment Control plan where using the earth dike to divert runoff is feasible. Determine the longitudinal slopes of the proposed temporary earth dike location.
2. Determine the maximum drainage area to various design points along the proposed earth dike alignment.
3. Enter Table 2 with the slope and drainage corresponding to the previously determined design points along the earth dike. Using Table 2 choose an earth dike type (A or B) and lining (1, 2, or 3) for the earth dike alignment between the design points.
4. Review the slopes along the earth dike alignment between the design points to insure that the slope/drainage area relationship does not exceed the chosen lining.



Table 2: Earth Dike Selection

	Drainage Area (acres)									
Slope % **	1	2	3	4	5	6	7	8	9	10
1	SEED	AND	4							
2	MULCH	4		SEED	AND	SOIL	STABILIZATION			
3				MATTING				6	6	6
4	4*						6			
5					6	6				
6				6		4" - 7"		STONE	PRESSED	
7			6			7" (Min)		INTO	GROUND	
8										
9										
10		6								

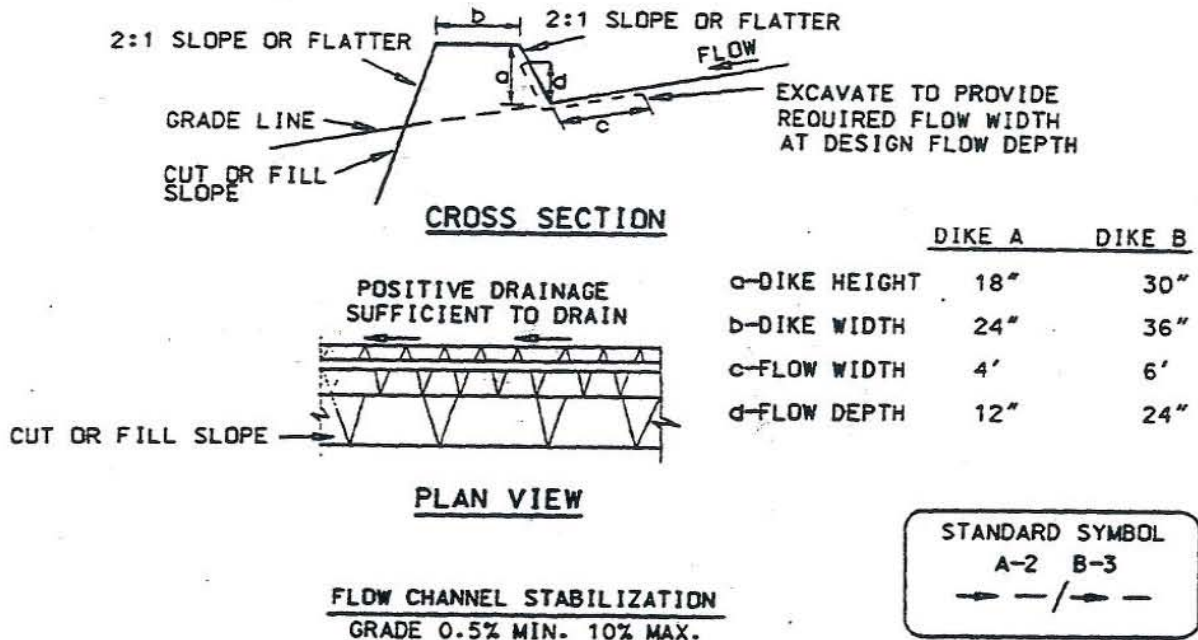
"A" Dike

"B" Dike

\*Velocity of discharge in feet/second

\*\* For slopes steeper than 10% refer to Section B - Grade Stabilization Structures

## DETAIL 1 - EARTH DIKE



1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

### Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

## CLEAR WATER DIVERSION FENCE ANALYSIS

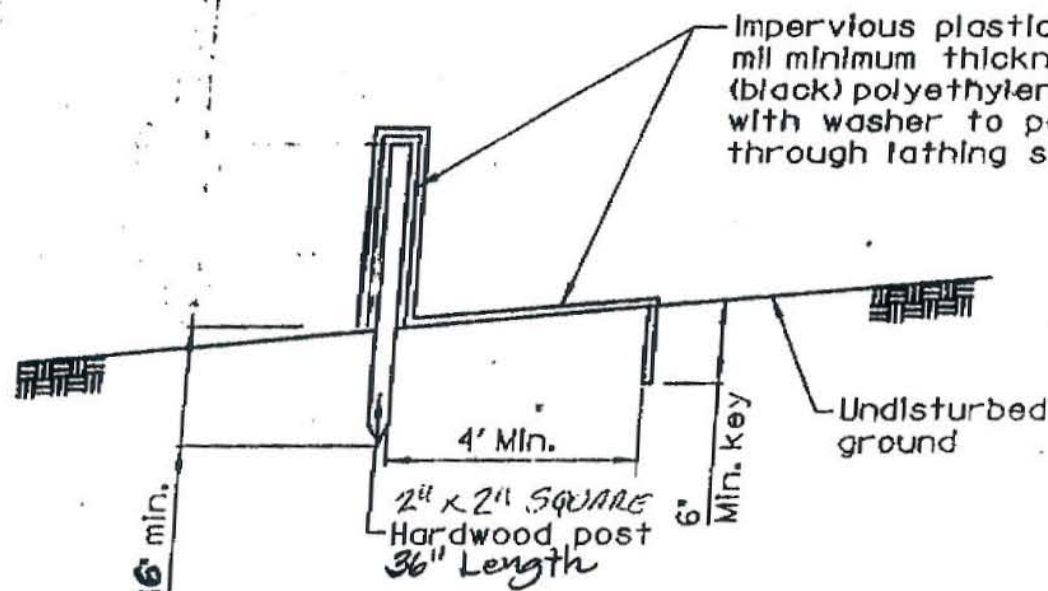
DRAINAGE AREA = 31367 SF = 0.72 AC

MAXIMUM DRAINAGE AREA to outlet = 2 acres

$$DA = 0.72 > 2 \text{ ACRES}$$

OK!





### TYPICAL DETAIL

### CLEAR WATER DIVERSION FENCE

Not to Scale

SYMBOL =

1. 5' Max. post spacing
2. Maintain <sup>an uninterrupted</sup> positive grade to a stable outlet.
3. Total width of polyethylene is 10' Min. per layer (A Folded 20' width is acceptable)
4. Longitudinal overlapping is 1' minimum. **OVERLAP THE UPGRADE SHEET OVER THE DOWNGRADE SHEET.**
5. Maximum longitudinal slope: 10%
6. Maximum drainage area to outlet = 2 acres

Post-It® Fax Note	7671	Date	11/27/07	# of pages	2
To	MELISSA GALEN	From	AMANDA MALCOLM		
Co./Dept.	CH2M HILL	Co.	MDE		
Phone #	(703) 376-5148	Phone #	(410) 537-3551		
Fax #	(703) 376-5648	Fax #	(410) 537-3553		



FLOW INTO CULVERT (TO BE DIVERTED AROUND  
SITE USING PUMP SYSTEM)

DRAINAGE AREA = 1.80 ACRES

IMPERVIOUS AREA = 7278 SF = 0.17 AC

$C_{\text{PERVIOUS}} = 0.30$

$C_{\text{IMPERVIOUS}} = 0.90$

$$C = \frac{0.30(1.63 \text{ AC}) + 0.9(0.17 \text{ AC})}{1.8 \text{ AC}} = 0.36$$

Assume  $t_c = 5 \text{ min} \therefore i_{\text{zyr}} = 5.38 \text{ in/hr}$

$$Q_{\text{zyr}} = C i_{\text{zyr}} A$$

$$= 0.35 \cdot 5.38 \text{ in/hr} \cdot 1.80 \text{ AC}$$

$$= 3.39 \text{ CFS}$$

## Culvert

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01800	ft/ft
Diameter	1.25	ft
Discharge	3.39	ft <sup>3</sup> /s

### Results

Normal Depth	0.54	ft
Flow Area	0.51	ft <sup>2</sup>
Wetted Perimeter	1.80	ft
Top Width	1.24	ft
Critical Depth	0.74	ft
Percent Full	43.5	%
Critical Slope	0.00629	ft/ft
Velocity	6.63	ft/s
Velocity Head	0.68	ft
Specific Energy	1.23	ft
Froude Number	1.82	
Maximum Discharge	9.32	ft <sup>3</sup> /s
Discharge Full	8.67	ft <sup>3</sup> /s
Slope Full	0.00275	ft/ft
Flow Type	SuperCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	43.46	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s

---

## Culvert

---

### GVF Output Data

Normal Depth	<u>0.54</u>	ft
Critical Depth	0.74	ft
Channel Slope	0.01800	ft/ft
Critical Slope	0.00629	ft/ft

## CALCULATION OF TOTAL DYNAMIC HEAD

$$\frac{P_1}{\gamma} + z_1 + \frac{V_1^2}{2g} + h_p = \frac{P_2}{\gamma} + z_2 + \frac{V_2^2}{2g} + h_c + \sum h_k + \sum h_f$$

$$z_1 + h_p = z_2 + \sum h_f$$



$$h_p = \Delta z + \sum h_f$$

$$h_f = \frac{(10.44)(L)(Q)^{1.85}}{C^{1.85} \cdot d^{4.8655}}$$

$$L = 281 \text{ ft}$$

$$Q = 3.39 \text{ CFS}$$

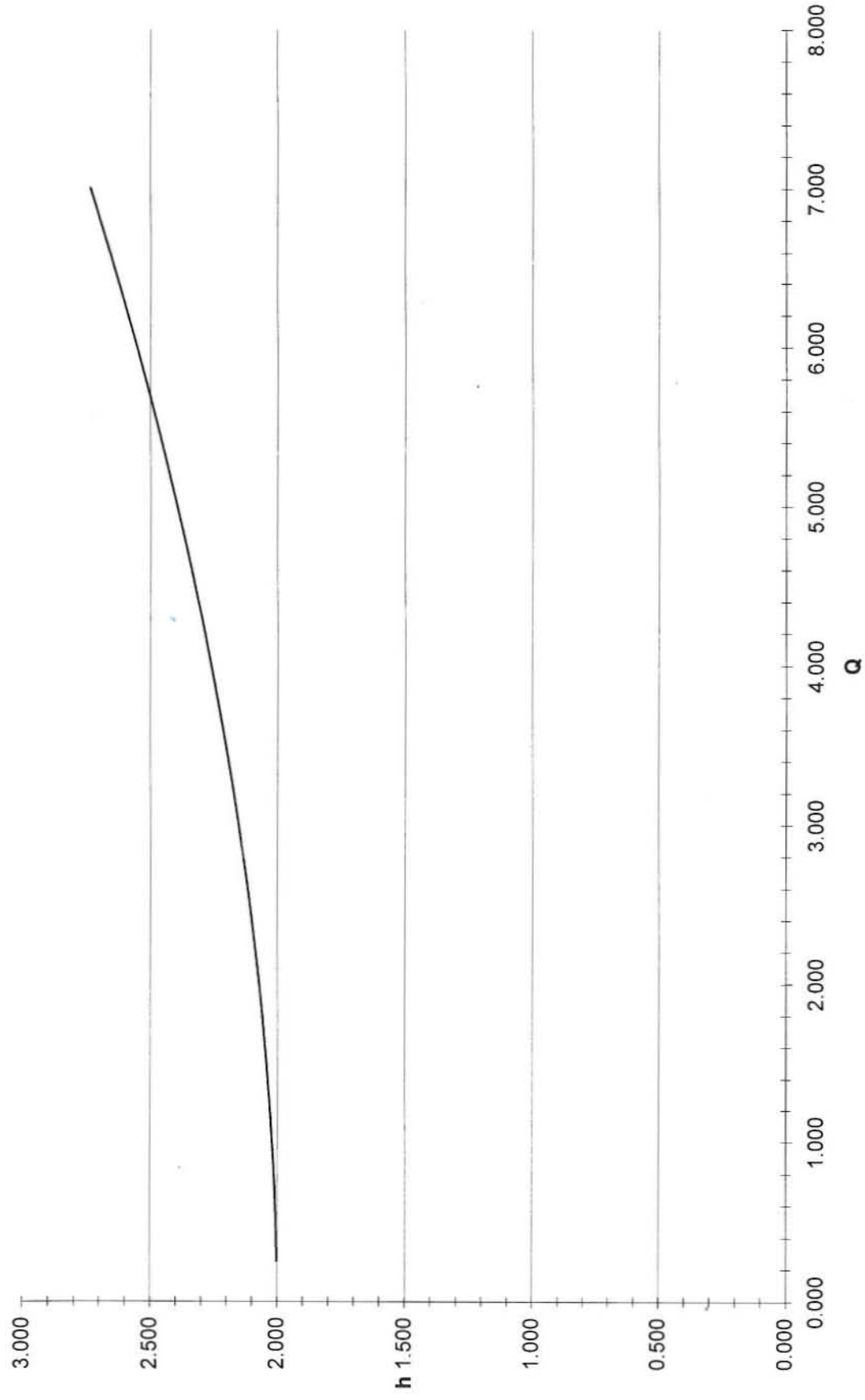
$$C = 100$$

$$d = 21 \text{ in}$$

$$h_f = \frac{(10.44)(281 \text{ ft})(3.39 \text{ CFS})^{1.85}}{100^{1.85} \cdot (21 \text{ in})^{4.8655}} = 0.19$$

$$h_p = 2' + 0.19 = 2.19 = 2.5 \text{ FT}$$

Q vs h



DRAINAGE AREA &amp; FLOW - PROPOSED DITCH REBUILD

$$AREA = 164073 \text{ SF} = 3.77$$

$$IMPERVIOUS AREA = 11760 \text{ SF} = 0.27$$

$$C_{IMPERVIOUS} = 0.90$$

$$C_{PERVIOUS} = 0.30$$

$$C = \frac{0.9(0.27) + 0.3(3.50)}{3.77}$$

$$= 0.34$$

$$I_c = 5.38 \text{ in/hr}$$

$$I_o = 5 \text{ min} \therefore I_o = 7 \text{ in/hr}$$

$$Q_2 = C_i A$$

$$= 0.34 \cdot 5.38 \text{ in/hr} \cdot 3.77 \text{ Ac}$$

$$= 6.90$$

$$Q_D = C_i A$$

$$= 0.34 \cdot 7 \text{ in/hr} \cdot 3.77 \text{ Ac}$$

$$= 8.97 \text{ CFS}$$

FROM ATTACHED WORKSHEETS PRODUCED  
BY HABSTEAD'S FLOW MASTER

$$V_2 = 3.45 \text{ ft/s}$$

$$V_{10} = 3.69 \text{ ft/s}$$



2 YEAR VELOCITY Calculation BR  
ECM SECTION OF PROPOSED DITCH  
(BEFORE RIPRAP)

ASSUME  $A = 3.70 \text{ AC}$

$$C = 0.34$$

$$t_c = 5 \text{ Min} \therefore i_2 = 5.38 \text{ in/hr}$$

$$Q_2 = C i_2 A$$

$$= 0.34 \cdot 5.38 \text{ in/hr} \cdot 3.70 \text{ AC}$$

$$= 6.77 \text{ CFS}$$

FROM HAESTAD

$$V_2 = 4.89 \text{ ft/s}$$

## Worksheet for Proposed Ditch Rebuild\_2Yr\_ECM

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.030	
Channel Slope	0.03700	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	6.77	ft <sup>3</sup> /s

### Results

Normal Depth	0.62	ft
Flow Area	1.38	ft <sup>2</sup>
Wetted Perimeter	3.77	ft
Top Width	3.48	ft
Critical Depth	0.72	ft
Critical Slope	0.01908	ft/ft
Velocity	4.89	ft/s
Velocity Head	0.37	ft
Specific Energy	0.99	ft
Froude Number	1.37	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.62	ft
Critical Depth	0.72	ft
Channel Slope	0.03700	ft/ft
Critical Slope	0.01908	ft/ft



ROCK OUTLET PROTECTION

CLASS I RIPRAP

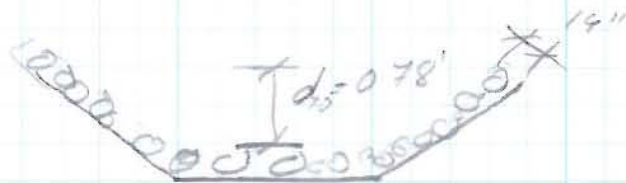
$$D_{50} = 9.5''$$

$$T = 19''$$

tailwater = 0' ABOVE INVERT

$$L_a = 30'$$

$$\text{RIPRAP} = 100 \text{ lb/CF}$$



$$\frac{19''}{12''/\text{FT}} \times (2.5' + 2.5' + 1') = 9.5 \text{ SF}$$

$$9.5 \text{ SF} \times 30 \text{ FT} = 285 \text{ CF}$$

$$\frac{100 \text{ lb}}{\text{CF}} \times 285 = 28,500 \text{ lb}$$

$$= 14,250 \text{ lb}$$

## Worksheet for Proposed Ditch Rebuild 2Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.041	
Channel Slope	0.02660	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	6.90	ft <sup>3</sup> /s

### Results

Normal Depth	0.78	ft
Flow Area	2.00	ft <sup>2</sup>
Wetted Perimeter	4.49	ft
Top Width	4.12	ft
Critical Depth	0.73	ft
Critical Slope	0.03555	ft/ft
Velocity	3.45	ft/s
Velocity Head	0.18	ft
Specific Energy	0.97	ft
Froude Number	0.87	
Flow Type	Subcritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.78	ft
Critical Depth	0.73	ft
Channel Slope	0.02660	ft/ft
Critical Slope	0.03555	ft/ft

## Worksheet for Proposed Ditch Rebuild\_10Yr

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.041	
Channel Slope	0.02660	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	8.97	ft <sup>3</sup> /s

### Results

Normal Depth	0.88	ft
Flow Area	2.43	ft <sup>2</sup>
Wetted Perimeter	4.94	ft
Top Width	4.52	ft
Critical Depth	0.83	ft
Critical Slope	0.03439	ft/ft
Velocity	3.69	ft/s
Velocity Head	0.21	ft
Specific Energy	1.09	ft
Froude Number	0.89	
Flow Type	Subcritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.88	ft
Critical Depth	0.83	ft
Channel Slope	0.02660	ft/ft
Critical Slope	0.03439	ft/ft

## 18.0 STANDARDS AND SPECIFICATIONS

### FOR

### ROCK OUTLET PROTECTION

#### Definition

Rock placed at the outfall of channels or culverts.

#### Purpose

To reduce the velocity of flow in the receiving channel to non-erosive rates.

#### Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts are sufficient to erode the next downstream reach. This applies to outlets of all types such as sediment basins, stormwater management ponds, and road culverts.

#### Design Criteria

The design method presented here applies to sizing rock rip-rap and gabions to protect a downstream area. It does not apply to rock lining of channels or streams. The design of rock outlet protection depends entirely on the location. Pipe outlets at the top of cuts or on slopes steeper than ten percent cannot be protected by rock aprons or rip-rap sections due to reconcentration of flows and high velocities encountered after the flow leaves the apron.

Be aware that many counties and state agencies have regulations and design procedures established for dimensions, type and size of materials, and locations where outlet protection is required.

#### 1. Tailwater Depth

The depth of tailwater immediately below the pipe outlet must be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the outlet pipe and the receiving stream is wide enough to accept divergence of the flow, it shall be classified as a Minimum Tailwater Condition. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it shall be classified as a Maximum Tailwater Condition. Pipes which outlet onto flat areas with no defined channel may be assumed to have Minimum Tailwater Condition.

#### 2. Apron Size

The apron length and width shall be determined from the curves according to the tailwater condition:

Minimum Tailwater	Use Table 19
Maximum Tailwater	Use Table 20



If the pipe discharges directly into a well-defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank, whichever is less. The upstream end of the apron adjacent to the pipe shall have a width two times the diameter of the outlet pipe or conform to pipe end section if used.

### 3. Bottom Grade

The outlet protection apron shall be constructed with no slope along its length. There shall be no obstruction at the end of the apron. The elevation of the downstream end of the apron shall be equal to the elevation of the receiving channel or adjacent ground.

### 4. Alignment

The outlet protection apron shall be located so that there are no bends in the horizontal alignment.

### 5. Materials

The outlet protection may be done using rock rip-rap, or gabions. Rip-rap shall be composed of a well-graded mixture of stone sized so that fifty (50) percent of the pieces, by weight, shall be larger than the size determined by using the charts. The minimum  $d_{50}$  size to be used shall be nine (9) inches. A well-graded mixture as used herein is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone in such a mixture shall be 2.0 times the size selected on the chart located in the following paragraph.

### 6. Thickness

For SHA rip-rap specifications the following values are used:

Table 18

Rip-rap Sizes and Thicknesses (SHA Specifications)

	$D_{50}$	$D_{100}$	Thickness
Class I	9.5"	15"	19"
Class II	16"	24"	32"
Class III	23"	34"	46"

### 7. Stone Quality

Stone for rip-rap shall consist of field stone or rough and hewn quarry stone. The stone shall be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5. Recycled concrete equivalent may be used provided it has a density of at least 150 pounds per cubic foot and does not have any exposed steel or reinforcing bars.

## 8. Filter

A filter is a layer of material placed between the rip-rap and the underlaying soil surface to prevent soil movement into and through the rip-rap to prevent piping, reduce uplift pressure, and collect water. Rip-rap shall have a filter placed under it in all cases. A filter can be of two general forms: a gravel layer or a Geotextile Class C<sup>27</sup>.

## 9. Gabions

Gabion baskets may be used as rock outlet protection, provided they are made of hexagonal triple twist mesh with heavily galvanized steel wire. The maximum lined dimension of the mesh opening shall not exceed 4 1/2 inches. The area of the mesh opening shall not exceed ten (10) square inches. Gabions shall be fabricated in such a manner that the sides, ends, and lid can be assembled at the construction site into a rectangular basket of the specified sizes. Gabions shall be of single unit construction and shall be installed according to the manufacturer's specifications. The area on which the gabion is to be installed shall be graded as shown on the drawings. Foundation conditions shall be the same as for placing rock rip-rap. Geotextile Class C shall be placed under all gabions. Gabions must be keyed in to prevent undermining of the main gabion structure. Refer to Table 28 for Gabion stone sizes.

## Maintenance

Once a rip-rap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows to see if scour beneath the rip-rap has occurred or if any stones have been dislodged. Repairs should be made immediately.

## Design Procedure

1. Investigate the downstream channel to assure that non-erosive velocities can be maintained.
2. Determine the tailwater condition at the outlet to establish which curve to use.
3. Enter the appropriate chart with the depth of flow and discharge velocity to determine the rip-rap size and apron length required. References to pipe diameters in the charts are based on full flow. For other than full pipe flow, the parameters of depth of flow and velocity must be used.
4. Calculate apron width at the downstream end if a flared section is to be employed.

## Examples

### Example 1: Pipe Flow (Full) with Discharge to Unconfined Section :

$Q = 280$  cfs, diameter = 66", tailwater is 2' above pipe invert (min. tailwater condition).

Read  $d_{50} = 1.2$  feet, and apron length = 38 feet.

Apron width = diameter +  $L_a = 5.5 + 38 = 43.5$  feet.

F-18-3

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<sup>27</sup> Refer to Table 27

Example 2: Box Flow (Partial) with High Tailwater:

A box culvert is flowing under partial flow conditions:

A concrete box 5.5 feet x 10 feet is flowing 5.0 deep;  $Q = 600$  cfs, and tailwater (surface) is 5' above invert (maximum tailwater condition);

$$V = Q/A = 600/(5 \times 10) = 12 \text{ fps}$$

At the intersection of the curve,  $d = 60$  inches,  $V = 12$  fps, read  $d_{50} = 0.4$  feet. Since  $d_{50} > 9$  inches, use  $d_{50} = 9$  inches.

Then reading to the  $d = 60$  inch curve, read apron length = 40 feet.

$$\text{Apron width, } W = \text{conduit width} + 0.04 L a = 10 + (0.4)(40) = 26 \text{ feet.}$$

Example 3: Open Channel Flow with Discharge to Unconfined Section:

A trapezoidal concrete channel 5 feet wide with 2:1 side slopes is flowing 2 feet deep;

$Q = 180$  cfs (velocity = 10 fps); and the tailwater (surface) downstream is 0.8 foot (minimum tail water condition).

At the intersection of the curve,  $d = 24$  inches,  $V = 10$  fps, read  $d_{50} = 0.7$  feet. Since  $d_{50} > 9$  inches, use  $d_{50} = 9$  inches.

Then reading to the  $d = 24$  inch curve, read apron length = 22 feet.

$$\text{Apron width, } W = \text{bottom of width of channel} + L a = 5 + 22 = 27 \text{ feet.}$$

Example 4: Pipe Flow (Partial) with Discharge to a Confined Section:

A 48 inch pipe is discharging with a depth of 3 feet;

$Q = 100$  cfs and the discharge velocity of 10 fps (established from partial flow analysis) to a confined trapezoidal channel with a 2 foot bottom, 2:1 side slopes,  $n = .04$ , and a grade of 0.6 %.

Calculation of the downstream channel (Manning's Equation) indicates a normal depth of 3.1 feet and a normal velocity of 3.0 fps. Since the receiving channel is confined, the maximum tailwater condition controls.

At the intersection of the curve,  $d = 36$  inches, and  $V = 10$  fps, read  $d_{50} = 0.3$  feet.

Since  $d_{50} > 9$  inches, use  $d_{50} = 9$  inches.

Then reading to the  $d = 36$  inch curve, read apron length = 30 feet.

Since the maximum flow depth in this reach is 3.1 feet, then the minimum depth of the rip-rap must be 4.1 feet.



#### Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
3. Geotextile Class C<sup>28</sup> or better shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile fabric over the damaged part or by completely replacing the geotextile fabric. All overlaps whether for repairs or for joining two pieces of geotextile fabric shall be a minimum of one foot.
4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile fabric. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

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<sup>28</sup> Refer to Table 27



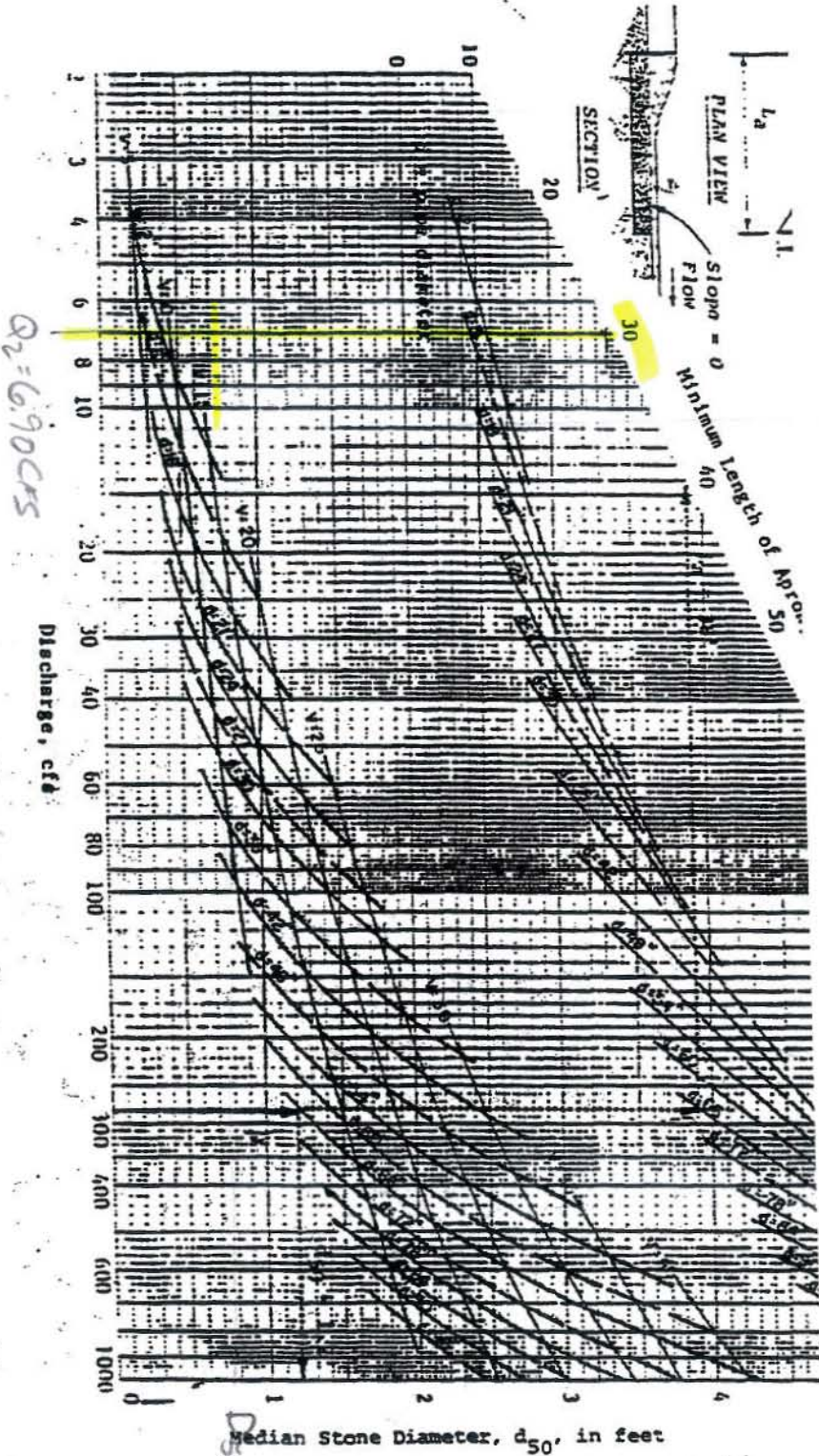


Table 19

## **Attachment C**

### **Soil Map**

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## Legend

### Soil Classifications

A-2, A-4, A-6, A-7

A-2, A-4, A-6

A-2, A-4

A-2, A-3, A-4, A-6, A-2-4

A-1, A-2, A-4, A-6

A-1, A-2, A-4

A-1, A-2, A-3, A-4, A-8

A-1, A-2, A-3, A-4, A-6

A-1, A-2, A-3, A-4, A-1-B

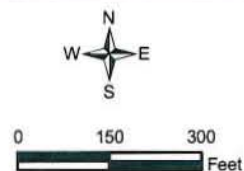
A-1, A-2, A-3, A-4

No Data Available

Installation Boundary

Site Boundary

Mattawoman Creek



Soil Classification  
Site 6  
NSF-IH, Indian Head, Maryland

**CH2MHILL**

**MARYLAND DEPARTMENT OF THE ENVIRONMENT**  
Water Management Administration • Sediment, Stormwater & Dam Safety Program  
1800 Washington Blvd. • Baltimore Maryland 21230  
(410) 537-3543 • 1-800-633-6101 • <http://www.mde.state.md.us>

**STORMWATER MANAGEMENT WAIVER APPLICATION**

OWNER: JEFFREY BOSSART MDE NO.: \_\_\_\_\_  
ADDRESS: 3972 WARD RD, SUITE 101 PROJECT NO.: \_\_\_\_\_  
INDIAN HEAD, MD 20640-5157 LOCATION: NAVAL SUPPORT FACILITY  
INDIAN HEAD  
CONSULTANT: CH2M HILL

DESCRIPTION: REMOVAL ACTION FOR SITE 60

I/We, the Owner/Owners hereby request a stormwater management waiver be granted for the above referenced project in accordance with the following section of the Stormwater Management Guidelines for State and Federal Projects:

- ☒ 3.3.A.1. Contract plans and provisions, stormwater management report.  
☐ 3.3.A.2. Contract plans and provisions, stormwater management report.  
☐ 3.3.A.3. Contract plans and provisions, stormwater management report.  
☐ 3.3.B.1. Contract plans and provisions, stormwater management report.  
☐ 3.3.B.2. Contract plans and provisions, stormwater management report, downstream impact investigation.  
☐ 3.3.B.3. Contract plans and provisions, stormwater management report.  
☐ 3.3.B.4. Contract plans and provisions, stormwater management report, downstream impact investigation.  
☐ 3.3.B.5. Contract plans and provisions, stormwater management report, downstream impact investigation.  
☐ 3.3.B.6. Contract plans and provisions, stormwater management report, downstream impact investigation.

Other evidence submitted: WORK PLAN FOR REMOVAL ACTION

JEFFREY BOSSART Jeffrey C. Bossart 8 Jan 2008  
Owner's Name Signature Date

Approved \_\_\_\_\_ Denied/Reason \_\_\_\_\_

By \_\_\_\_\_ Date \_\_\_\_\_  
Water Resources Reviewer

Submit to: Maryland Department of the Environment  
Water Management Administration  
Sediment and Stormwater Plan Review Division  
1800 Washington Boulevard, 4<sup>th</sup> Floor  
Baltimore, MD 21230

If a project involves a waiver request for more than one (1) drainage area, a Stormwater Management Waiver Application is required for each drainage area.



**MARYLAND DEPARTMENT OF THE ENVIRONMENT**

1800 Washington Boulevard • Baltimore MD 21230

410-537-3000 • 1-800-633-6101

Martin O'Malley  
Governor

Shari T. Wilson  
Secretary

Anthony G. Brown  
Lieutenant Governor

Robert M. Summers, Ph.D.  
Deputy Secretary

March 19, 2008

Mr. Joseph Rail, P.E.  
NAVFAC Washington  
Washington Navy Yard, Bld. 212  
1314 Harwood Street SE  
Washington, DC 20374-5018

RE: Draft Removal Action Work Plan for Site 6 (Fenced Area) Erosion and Sediment Control  
Plan, Naval Support Facility Indian Head, December 2007

Dear Mr. Rail:

The Federal Facilities Division of the Maryland Department of the Environment's Hazardous Waste Program has no comment on the above referenced document. This document was forwarded to the Water Management Administration's (MDE-WMA) Non Point Source Control Division for review as well. Comments from MDE-WMA are enclosed.

If you have any questions, please contact me at (410) 537-3791.

Sincerely,

Curtis DeTore  
Section Head  
Federal Facilities Division

CD:cd

Enclosure

cc: Mr. Dennis Orenshaw  
Mr. Horacio Tablada  
Mr. Harold L. Dye, Jr.


## **MEMORANDUM**

DATE: March 11, 2008

TO: Curtis Detore, WMA, Federal Facilities Division

FROM: Neil Clemens, WMA Sediment and Stormwater Plan Review Division

RE: Soil Removal Action, Site 6, Naval Support Activity, Indian Head, Maryland  
N40080-07-D-301 TO#005



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As requested, WMA has reviewed the subject submittal for the referenced project with regard to Erosion & Sediment Control and Stormwater Management. Please fully address each comment below and make the necessary revisions to the drawings. Then, return **one [1]** set of the revised prints for review with a copy of this letter and a point-by-point response letter addressing each comment. If you wish to see the marked up plan set containing our comments, please contact us at (410) 537-3524 [or 3543] to schedule an appointment.

### **General:**

1. Please confirm the quantity for "Project Disturbance" [i.e., 0.2 AC] on the SWM/E&SC Application. Note that Note 27, item 'c' on Sheet 3 shows a disturbed area of 0.4 AC that seems accurate per our calculations. Please revise accordingly.

### **2. Sheet 1, Title Sheet:**

- a. Add a Drawing Revision Block with date and "Revised per MDE comments" in the revision field.
- b. Provide a Vicinity Map with major roads, land features and more coverage of Charles County.
- c. Sheet Index - Reverse the sheet titles for Sheets G-5 and G-6.

### **Stormwater Management [SWM]**

Your SWM Waiver Request [per Sect 3.3.A.1, SWM Guidelines for State & Federal Projects] has been reviewed and appears to have merit. We understand the scope of work is limited to soil remediation with only minor grading along the existing ditch and no additional impervious area shall be added. Therefore, I will recommend to the Chief of Sediment & Stormwater Plan Review Division that your SWM waiver request be approved. Official notification will be forthcoming under future correspondence.



**Erosion & Sediment Control [E&SC]**

1. **General Note:** The Maryland Erosion and Sediment Control Guidelines for State and Federal Projects are now available on MDE's web site [www.mde.state.md.us](http://www.mde.state.md.us). Please be advised that the Standard Erosion and Sediment Notes have been revised and the revised version must appear on the plans for future projects. Please substitute the new notes for the old ones on Sheet 3; and, remove the references to "ROICC" throughout the notes. Check the information in Note #27 where indicated on the plans. Per comment '3' above, please update Item 'c' in Note 27, "Disturbed Area".

2. **Sheet 2 - Abbreviations & Legend.**

- a. On the Legend, fill in an "ID" for all items E&SC items used on this project.
- b. Per comment '6b' below, the check dam may be replaced with a "TSOS". If so, revise the Legend.
- c. Also, per comment '6c' below, revise the symbol for earth dike to read "A-2".

3. **Sheet 3 - E&SC Notes**

- a. Comment 1 above applies.
- b. Sequence of Construction.
  1. The correct phone number for MDE Compliance Division is (410) 537-3510.
  2. Add the following to the end of Item 2: "Provide survey and layout of the Limits of Disturbance [LOD]. The LOD must be field marked prior to clearing trees, installation of sediment controls or other land disturbing activities".
  3. At this phrase to end of Item 6: "of these sediment control devices".
  4. At this as the last sentence of Item 17: "Stabilize the remaining disturbed areas".
- c. Delete the Design Certification Block [DCB] and provide the updated version [attached].

4. **Sheet 4 - Vegetative Stabilization**

- a. Add the missing paragraphs [F, G & H] on pp. G-20-4, 5 & 6 from Section 20, 1994 MD E&SC Manual.
- b. Add the Temporary and Permanent Seeding Summary Tables [same manual] found on pp. G-20-8, 9.

5. **Sheet 6 - Erosion Control Maintenance Schedule**

- a. On 2<sup>nd</sup> item, note there is no silt fence shown on the plans. Revise to read "Clear Water Diversion Fence".
- b. On 3<sup>rd</sup> item [Earth Dike], add this phrase to the end: "and maintained as necessary".
- c. On the 4<sup>th</sup> item, note per comment '6b' below that the check dam might not be used. Revise accordingly.

6. **Sheet 7 - E&SC Plan**

- a. Limits of Disturbance [LOD]. Darken the LOD line to make it more prominent.
- b. Proposed Stone Check Dam [SCD]. The Narrative states that an SCD will be used to filter sediment laden runoff from the disturbed area. An SCD shall be used only as a velocity check and not to filter sediment. Since the purpose is to filter surface runoff, use a TSOS [if the drainage area is less than 0.5 AC] and add MDE Std Detail 19 on Sheet 8. Remove the SCD from Sheets 7 & 8, and, add the TSOS. All disturbed areas must drain to MDE approved sediment control measures.
- c. Proposed Earth Dike. The earth dike shown must satisfy the requirements of Table 2, p. A-1-5 of the 1994 MD E&SC Manual. As the dike is drawn, there are seven [7] sections from contours 28 to 19 that have longitudinal slopes at 4% and greater. Since the calculated velocity exceeds 4 fps [not using Manning's equation] in some areas, being conservative would require the "A-2" designation seeding and soil stabilizing matting [not mulch]. Please investigate and correct.

- d. Please correct the "6 ft" dimension for the "A-2" dike shown since it's inaccurate. Should be 14 feet.
- e. In addition to comment 'c' above, please address the off-site "clean" runoff [outside the LOD] coming from the southeast side of the existing building and Deep Point Court? We recommend extending the earth dike to follow the LOD up to the edge of Deep Point Court to divert this runoff away from the project.
- f. Existing Culvert & Pump Around operation. Ensure the culvert to be replaced [i.e., 40-ft section] is shown to be within the LOD. Next, please show the outfall location of the existing culvert since it's not clear where it ends. Is the outfall currently stable? Does it need riprap outfall protection? Also, show the clean water dike [sandbag dike] location on the plans.
- g. Optional Stockpile. Is this the best location [over the culvert]? Also, add the sediment controls for this stockpile now in lieu of leaving it up to the contractor.
- h. The proposed earth dike and clear water diversion fence must discharge onto undisturbed, stabilized areas. Please extend both of these measures a little further past the fence than currently shown. It seems the contractor will have to remove a section of the existing fence to do the ditch work and install the various E&SC measures. Recommend adding a note for this fence work.
- i. Delete the extraneous symbol "A-1" along the clear water diversion fence [near contours 18 & 19].
- j. Label the clear water diversion fence as "CWDF" for clarity. Use this ID symbol on the Legend.
- k. The discharge hose from the pump [appears as a solid line] runs along the CWDF and then departs near contour 20 and runs in the ditch. Is there a reason why the hose does not run along the CWDF the entire length? Please address.
- l. General comment. Please ensure that additional sediment control measures incorporated in this plan satisfy the design criteria and specs in the 1994 MD E&SC Manual. Additional sediment controls selected should be added to the Legend and the MDE Std Detail placed on the plans.

7. **Sheet 8 - Details.** On Detail 7, Material Handling Area, the material is shown to be higher than the 1'-6" berm around the material. This could be a simple drafting error; however, please provide a 6" freeboard from the top of the berm to the top of the stored material and draw this on Detail 7.

### **Advisory Comments**

1. The plans indicate that trees may be removed and/or relocated. Applicants are advised that projects submitted for sediment control approval are subject to the requirements of the Maryland Forest Conservation Act (FCA), Annotated Code of Maryland, Natural Resources Article Section 5-1601, et seq., and regulations adopted thereunder. Failure to comply with the FCA may result in enforcement actions, such as monetary penalties, as imposed by the Act. For further information, please contact the appropriate regional office as indicated on the attached "State Forest Conservation Program" information sheet.
2. This project is located in the Critical Area of the Bay. I recommend that you contact the Critical Areas Commission at 410-260-3460 to determine what, if any, involvement they may desire in this project.

Please contact me at X4416 if you have any questions.

Attachment [2]



## DESIGN CERTIFICATION

I hereby certify that this plan has been designed in accordance with the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, the 2000 Maryland Stormwater Design Manual, Volumes I & II and the Maryland Department of the Environment erosion and sediment control and stormwater management regulations.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Designer's Signature

Md. Registration No. \_\_\_\_\_  
P.E., R.L.S., RLA, or R.A. (circle one)

\_\_\_\_\_  
Printed Name

[1]

## Soil Removal Action, Site 6, Naval Support Activity, Indian Head, Maryland N40080-07-D-301 TO#005

TO: Neil Clemens, WMA Sediment and Stormwater Plan Review  
Division

COPIES: Christine Metcalf, CH2M HILL Project Manager  
Edward Underwood, CH2M HILL

FROM: Melissa A. Shindorf, CH2M HILL

DATE: May 6, 2008

Following is a point-by-point response to your comment letter dated March 11, 2008. In this package you will also find a copy of the revised plans as well as a copy of your original letter. I appreciate your time on April 10, 2008 to discuss these comments.

### Erosion and Sediment Control MDE Comment Responses

#### General:

1. *Please confirm the quantity for "Project Disturbance" [i.e. 0.2 AC] on the SWM/ES&C Application. Note that Note 27, item 'c' on Sheet 3 shows a disturbed area of 0.4 AC that seems accurate per our calculations. Please revise accordingly.*

Response: Disturbed area was confirmed to be 0.40 acres.

2. *Sheet 1, Title Sheet:*
  - a. *Add a Drawing Revision Block with date and add "Revised per MDE Comments" in the revision field.*
  - b. *Provide a Vicinity Map with major roads, land features, and more coverage of Charles County.*
  - c. *Sheet Index- Reverse the sheet titles for Sheets G-5 and G-6.*

Response: Sheet 1, Title Sheet:

- a. "Revised per MDE comments" was added to revision block in the border.
- b. Vicinity Map obtained from mapping program and added to coversheet.
- c. Reversed sheet titles for G-5 and G-6.

#### Stormwater Management [SWM]

*Your SWM Waiver Request [per Sect 3.3.A.1, SWM Guidelines for State & Federal Projects] has been reviewed and appears to have merit. We understand the scope of work is limited to soil remediation with only minor grading along the existing ditch and no additional impervious area shall be added. Therefore, I will recommend to the Chief of Sediment & Stormwater Plan Review Division*

*that your SWM waiver request be approved. Official notification will be forthcoming under future correspondence.*

Response: Comment is noted.

**Erosion & Sediment Control (E&SC):**

1. **General Note:** *The Maryland Erosion and Control Guidelines for State and Federal Projects are now available on MDE's website [www.mde.state.md.us](http://www.mde.state.md.us). Please be advised that the Standard Erosion and Sediment Notes have been revised and the revised version must be on the plans for future projects. Please substitute the new notes for the old ones on Sheet 3; and, remove the references to "ROICC" throughout the notes. Check the information in Note #27 where indicated on the plans. Per comment '3' above, please update Item 'c' in Note 27, "Disturbed Area".*

Response: The Maryland Erosion and Sediment Control Guidelines for State and Federal Projects document was reviewed and the Standard Erosion and Sediment Control Notes were revised as necessary. All references to ROICC were removed from the notes. There was no need to update Note #27, as the disturbed area quantity remained correct (see response to General Comment #1).

2. **Sheet 2 – Abbreviations & Legend.**

- a. *On the Legend, fill in an "ID" for all items, including E&SC items used on this project.*
- b. *Per comment '6b' below, the check dam may be replaced with a "TSOS". If so, revise the Legend.*
- c. *Also, per comment '6c' below, revise the symbol for earth dike to read "A-2"*

Response:

- a. ID column was determined to be redundant and thus deleted.
- b. Check dam was replaced with Stone Outlet Structure, and the legend was revised accordingly.
- c. Replaced A-2 with A-# as both the A-1 and A-2 type earth dike is utilized.

3. **Sheet 3 – E&SC Notes.**

- a. *Comment 1 above applies.*
- b. *Sequence of Construction.*
  - i. *The correct phone number for MDE Compliance Division is (410) 537-3510.*
  - ii. *Add the following to the end of Item 2: "Provide survey and layout of the Limits of Disturbance (LOD). The LOD must be field marked prior to clearing trees, installation of sediment controls or other land disturbing activities."*
  - iii. *Add this phrase to end of Item 6: "of these sediment control devices."*
  - iv. *Add this as the last sentence of Item 17: "Stabilize the remaining disturbed areas."*

- c. *Delete the Design Certification Block (DCB) and provide the updated version (attached).*

Response:

- a. See response to E&SC Comment 1.
- b. Sequence of Construction
  - i. Phone number for MDE Compliance Division was checked and is correct.
  - ii. Added the following text to the end of Item 2: "Provide survey and layout of the Limits of Disturbance (LOD). The LOD must be field marked prior to clearing trees, installation of sediment controls or other land disturbing activities."
  - iii. Added the following phrase to the end of Item 6: "of these sediment control devices."
  - iv. Added the following text to the end of Item 17: "Stabilize the remaining disturbed areas."
- c. The Design Certification Block was revised.

**4. *Sheet 4 – Vegetative Stabilization.***

- a. *Add the missing paragraphs (F, G &H) on pp. G-20-4, 5 & 6 from Section 20, 1994 MD E&SC Manual.*
- b. *Add the Temporary and Permanent Seeding Summary Tables (same manual) found on pp. G-20-8, 9.*

Response:

- a. Added paragraphs F, G &H from Section 20 of the 1994 Maryland Erosion and Sediment Control Manual.
- b. Added the Temporary and Permanent Seeding Tables.

**5. *Sheet 6 – Erosion Control Maintenance Schedule.***

- a. *On 2<sup>nd</sup> item, note there is no silt fence shown on the plans. Revise to read "Clear Water Diversion Fence".*
- b. *On 3<sup>rd</sup> item (Earth Dike), add this phrase to the end: "and maintained as necessary".*
- c. *On the 4<sup>th</sup> item, note per comment 6b below that the check dam might not be used. Revise accordingly.*

Response:

- a. Silt Fence was added to the Stockpile areas; therefore, the 2<sup>nd</sup> item was revised to read "Silt Fence and Clear Water Diversion Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height."

- b. The following phrase was added to the end of the 3<sup>rd</sup> item: “and maintained as necessary.”
- c. The 4<sup>th</sup> item was revised as follows: “Stone Outlet Structure shall be checked periodically and after each significant rainfall. Accumulated sediment shall be removed when it has reached ½ of the original height of the weir crest.”

**6. Sheet 7 – E&SC Plan.**

- a. *Limits of Disturbance (LOD). Darken the LOD line to make it more prominent.*
- b. *Proposed Check Dam (SCD). The Narrative states that an SCD will be used to filter sediment laden runoff from the disturbed area. An SCD shall be used only as a velocity check and not to filter sediment. Since the purpose is to filter surface runoff, use a TSOS (if drainage area is less than 0.5 AC) and add MDE Std Detail 19 on Sheet 8. Remove SCD from Sheets 7 & 8, and add the TSOS. All disturbed areas must drain to MDE approved sediment control measures.*
- c. *Proposed Earth Dike. The earth dike shown must satisfy the requirements of Table 2, p. A-1-5 of the 1994 MD E&SC Manual. As the dike is drawn, there are seven (7) sections from contours 28 to 19 that have longitudinal slopes at 4% and greater. Since the calculated velocity exceeds 4 fps (not using Manning’s equation) in some areas, being conservative would require the “A-2” designation seeding and soil stabilizing matting (not mulch). Please investigate and correct.*
- d. *Please correct the “6 ft” dimension for the “A-2” dike shown since it’s inaccurate. Should be 14 feet.*
- e. *In addition to comment “c” above, please address the off-site “clean” runoff (outside the LOD) coming from the southeast side of the existing building and Deep Point Court? We recommend extending the earth dike to follow the LOD up to the edge of Deep Point Court to divert this runoff away from the project.*
- f. *Existing Culvert & Pump Around operation. Ensure the culvert to be replaced (i.e., 40-ft section) is shown to be within the LOD. Next, please show the outfall location of the existing culvert since it’s not clear where it ends. Is the outfall currently stable? Does it need riprap outfall protection? Also show the clean water dike (sandbag dike) location on the plans.*
- g. *Optional Stockpile. Is this the best location (over the culvert)? Also add the sediment controls for this stockpile now in lieu of leaving it up to the contractor.*
- h. *The proposed earth dike and clear water diversion fence must discharge onto undisturbed, stabilized areas. Please extend both of these measures a little further past the fence than currently shown. It seems the contractor will have to remove a section of the existing fence to do the ditch work and install the various E&SC measures. Recommend adding a note for this fence work.*
- i. *Delete the extraneous symbol “A-1” along the clear water diversion fence (near contours 18 & 19).*
- j. *Label the clear water diversion fence as “CWDF” for clarity. Use this ID Symbol on the Legend.*

- k. *The discharge hose from the pump (appears as a solid line) runs along the CWDF and then departs near contour 20 and runs in the ditch. Is there a reason why the hose does not run along the CWDF the entire length? Please address.*
- l. *General comment. Please ensure that additional sediment control measures incorporated in this plan satisfies the design criteria and specs in the 1994 MD E&SC Manual. Additional sediment controls selected should be added to the Legend and the MDE Std Detail placed on the plans.*

Response:

- a. LOD line was darkened to appear more prominent.
- b. The Check Dam was replaced with a Stone Outlet Structure. Drainage area to this structure was determined to be less than 0.5 acre. The plan sheet was updated, and the Maryland Detail 19 replaced the Check Dam Detail on Sheet 8.
- c. As we discussed by phone on 4/10/08, on Page A-1-3 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control under the heading *Engineering Design Criteria* it states that the allowable flow channel velocities shall be < 4 fps for Seed and Mulch, < 6 fps for Stabilization Matting or sod, and < 8 fps for 4" - 7" stone. According to our calculations using the worst case slope (8%) and the greatest flow for this earth dike, the maximum velocity is 3.52 fps, which is less than 4 fps - the threshold for the use of Seed and Mulch. Also, the drainage area going to this earth dike is less than 1 acre. Therefore, we determined that we could not use Table 2 on page A-1-5 of the E&SC Manual and instead calculated the velocities by hand. According to our calculations, A-1 type Earth Dike is appropriate, except for the last 23 feet where the velocity calculated is greater than 4 fps (i.e., requires erosion control matting).
- d. The dimension of the A-2 section of earth dike was revised to read 23'.
- e. Clarified comment on 4/10/08 phone call with Neil Clemens. Earth dike was extended towards Building 1718, and all buildings were called out to reduce confusion.
- f. Culvert to be replaced was confirmed to be within the LOD. Outfall location was identified on the plan. The current outfall appears to be stable. Outfall velocity was determined to be around 5 fps. The proposed ditch will be lined with about 220' of erosion control matting beginning at the culvert outfall. This will provide protection at the outfall point, given the expected velocity of 5 fps. Location of Sandbag Dike was added to plans.
- g. As discussed on 4/10/08 phone call, due to the limited area within this site this is the best location for the optional stockpile area. This optional stockpile will be restricted to a height of 14', which will minimize the likelihood of damage to the culvert pipe. In addition, the proposed culvert pipe is to be replaced after the site is to be backfilled. Therefore, there is not a concern that the proposed pipe will get damaged due to the loading from the stockpile. Silt fence was added to the optional stockpile.

- h. Both the proposed earth dike and the clear water diversion fence were lengthened to outfall onto undisturbed, stabilized areas. Also a note was added in reference to fence work that may be necessary.
  - i. Extraneous "A-1" along CWDF was deleted.
  - j. Clear Water Diversion Fence was labeled CWDF and added to legend.
  - k. The discharge hose was revised such that it runs along CWDF and then discharges into the ditch after the TSOS.
  - l. All sediment control measures satisfy the design criteria and specifications in the 1994 Maryland E&SC Manual. All measures are referred to in the Legend as well as on the detail sheet.
7. ***Sheet 8 - Details.*** *On Detail 7, Material Handling Area, the material is shown to be higher than the 1' 6" berm around the material. This could be a simple drafting error; however, please provide a 6" freeboard from the top of the berm to the top of the stored material and draw this on Detail 7.*

Response: Detail 7 was redrawn to show a 6" "freeboard" between the top of berm and the top of the stored material.

#### **Advisory Comments**

1. *The plans indicate that trees may be removed and/or relocated. Applicants are advised that projects submitted for sediment control approval are subject to the requirements of the Maryland Forest Conservation Act (FCA), Annotated Code of Maryland, Natural Resources Article Section 5-1601, et seq., and regulations adopted thereunder. Failure to comply with the FCA may result in enforcement actions, such as monetary penalties, as imposed by the Act. For further information, please contact the appropriate regional office as indicated on the attached "State Forest Conservation Program" information sheet.*

Response: Comment is noted.


2. *This project is located in the Critical Area of the Bay. I recommend that you contact the Critical Areas Commission at 410-260-3460 to determine what, if any, involvement they may desire in the project.*

Response: Comment is noted.

## MEMORANDUM

DATE: June 5, 2008

TO: Curtis Detore, WMA, Federal Facilities Division

FROM:  Neil Clemens, WMA Sediment and Stormwater Plan Review Division

RE: Soil Removal Action, Site 6, Naval Support Activity, Indian Head, Maryland  
N40080-07-D-0301

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As requested, WMA has reviewed the resubmission for the above referenced project with regard to Stormwater Management [SWM] and Erosion & Sediment Control [E&SC]. Most review comments have been properly addressed. We have the following minor comments below for Sheet 4 of 8:

1. On the Temporary Seeding Table, the application rate for Rye should be 3.22 lb/1000 SF.
2. On the Permanent Seeding Table, for Mix No.1 [Tall Fescue], seeding dates should be from 3/1 to 5/15 and 8/15 to 11/15.

We have approved these drawings 'subject to comment'. Please have the consultant make these revisions to Sheet 4 of 8. Then, Sheets 1 through 8 of 8 shall be the approved plan set for SWM and Erosion & Sediment Control. We will not require another formal submission; however, please make the above revisions.

Please contact me at X4416 if you have any questions or need additional information.